United States Department of Agriculture

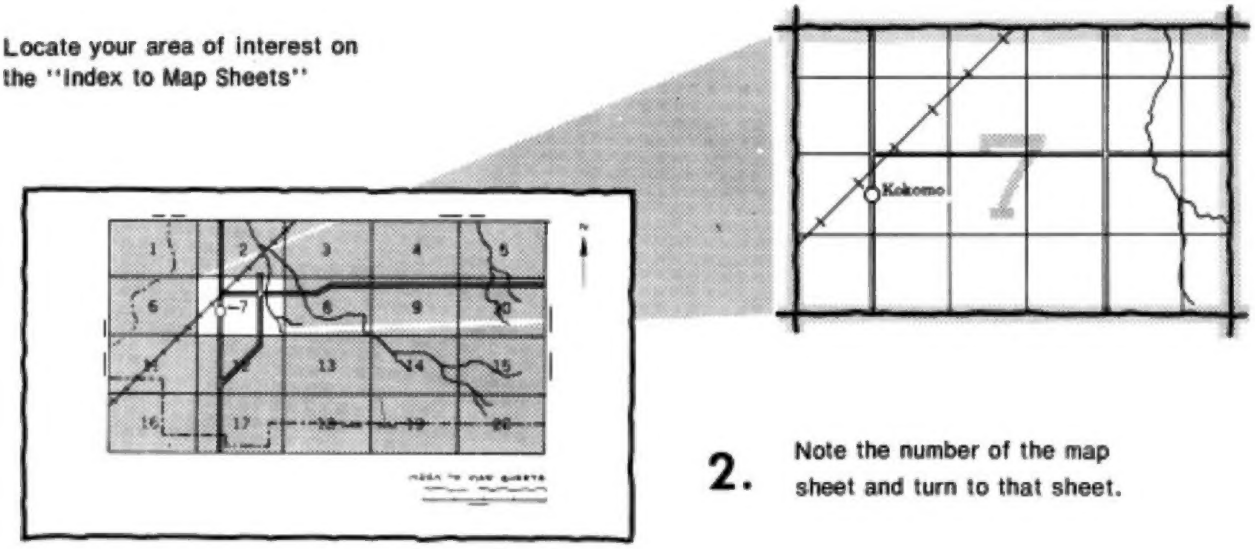
Soil Conservation Service

In cooperation with Cornell University Agricultural Experiment Station

Soil Survey of Warren County New York

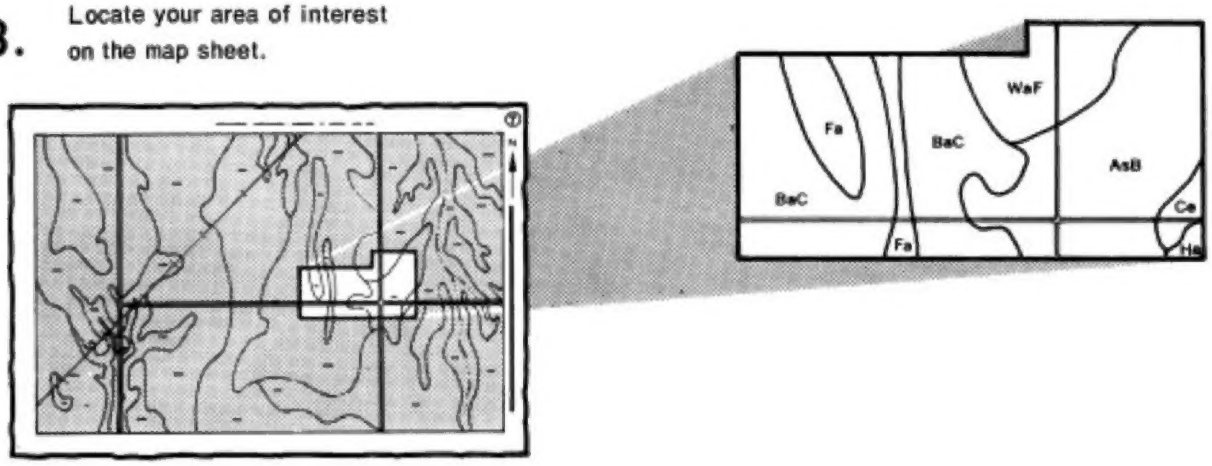
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

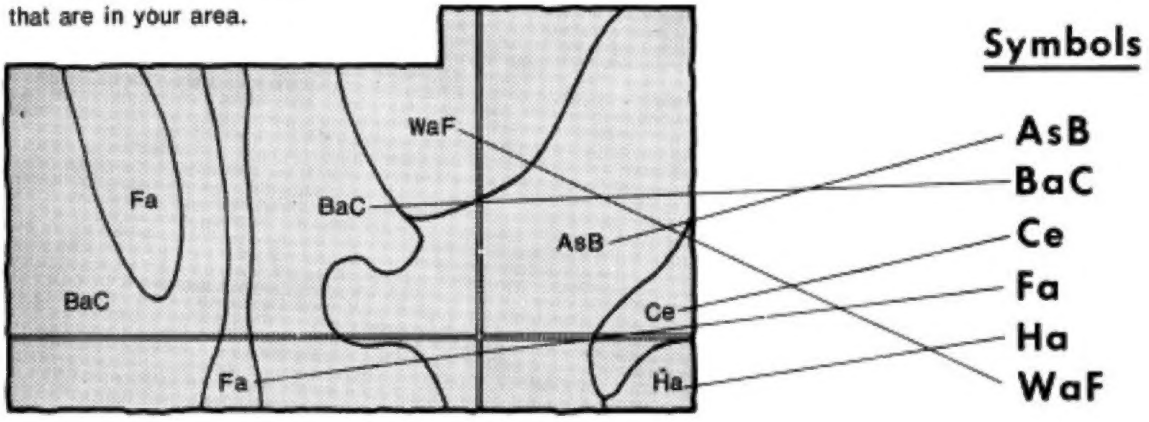


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

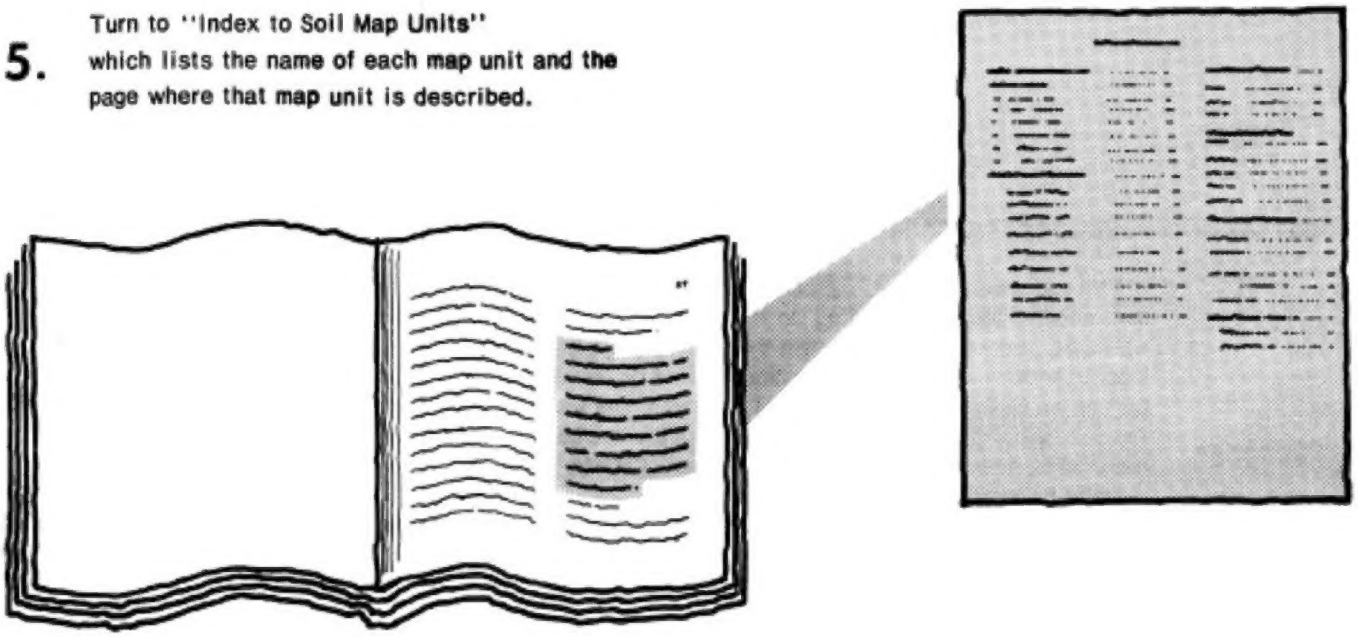


4. List the map unit symbols that are in your area.

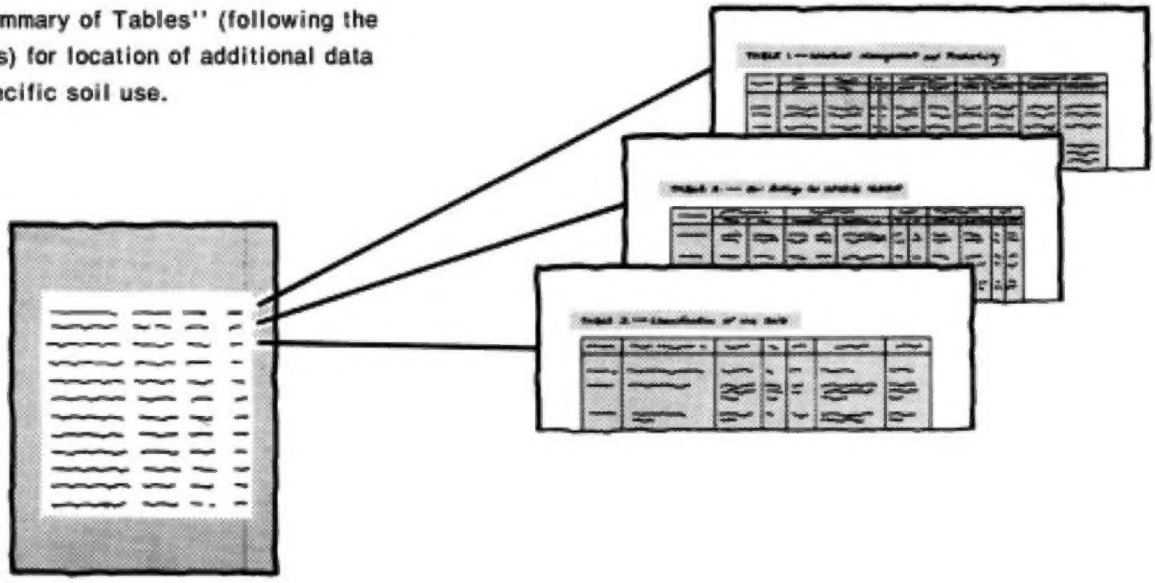


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, handicap, or age.

Major fieldwork for this soil survey was completed in 1981. Soil names and descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1981. This survey was made cooperatively by the Soil Conservation Service and the Cornell University Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Warren County Soil and Water Conservation District. It was funded in part by the Warren County Board of Supervisors through the Warren County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: The Bice-Woodstock general soil map unit is dominant in the area of Lake George. In most areas it is wooded. Areas near the lake are used extensively for recreation. (Photo courtesy of Richard K. Dean)

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Soil Series

Issued January 1989

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Summary of Tables

Foreword

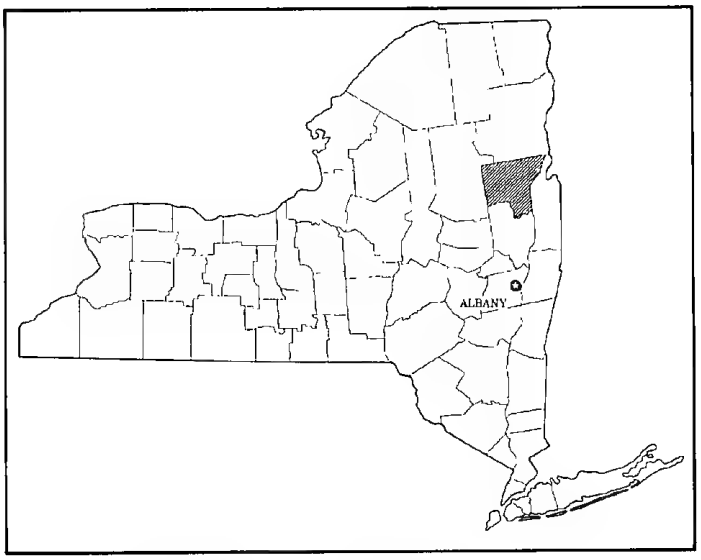
This soil survey contains information that can be used in land-planning programs in Warren County, New York. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Paul A. Dodd
State Conservationist
Soil Conservation Service



Location of Warren County in New York.

Soil Survey of Warren County, New York

By Charles H. Maine, Soil Conservation Service

Fieldwork by Burton R. Laux, Robert L. Holmes, Frank J. Winkler, William H. Taylor, Pred D. Holman, Mark H. Silverman, and Charles H. Maine, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with Cornell University Agricultural Experiment Station

WARREN COUNTY is in the eastern part of New York. Its land area is 565,120 acres. The county is bounded on the north by Essex County, on the east by Washington County, on the south by Saratoga County, and on the west by Hamilton County.

The elevation of the county ranges from 300 feet above sea level at the Warren County airport to 3,583 feet at the top of Gore Mountain *(17)*. In 1980 the population of Warren County was 54,820, and 64 percent of the population was living in the southeast corner of the county in the city of Glens Falls and the town of Queensbury. Approximately 93 percent of Warren County is woodland. Of the total woodland area, about 340,000 acres is commercial forest land and about 185,000 acres is noncommercial. About 93 percent of Warren County is within the boundary of the Adirondack Park.

General Nature of the County

This section provides general information about the climate, drainage, water supply, history, recreation, and transportation and industry of Warren County.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

In Warren County winters are cold and summers are moderately warm and have occasional hot spells. The Adirondack Mountains are markedly cooler than the main agricultural areas in the lowlands. Precipitation is well distributed throughout the year and is nearly always adequate for all crops. Winter snows occur frequently, occasionally as blizzards, and cover the ground much of the time.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Glens Falls in the period 1951 to 1976. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 21 degrees F, and the average daily minimum temperature is 12 degrees. The lowest temperature on record, which occurred at Glens Falls on January 12, 1968, is -33 degrees. In summer the average temperature is 68 degrees, and the average daily maximum temperature is 79 degrees. The highest recorded temperature, which occurred at Glens Falls on July 17, 1953, is 99 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 35 inches. Of this, 19 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 15 inches. The heaviest

1-day rainfall during the period of record was 3.65 inches at Glens Falls on August 28, 1971. Thunderstorms occur on about 27 days each year, and most occur in summer.

The average seasonal snowfall is 66 inches. The greatest snow depth at any one time during the period of record was 51 inches. On the average, 42 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in late winter and early spring.

Drainage

The main drainage systems in the county are the Hudson River, which drains about 80 percent of the land area, and Lake Champlain. The Hudson River enters the county at North River and flows south. It leaves the county near Glens Falls. The Schroon River, a large tributary of the Hudson River, flows south from Schroon Lake and joins the Hudson River west of Warrensburg.

In the western part of the county, the east branch of the Sacandaga River and tributaries of East Stony Creek flow southwesterly. They drain into the Sacandaga Reservoir in Saratoga County and eventually flow into the Hudson River at Lake Luzerne.

Lake George, Glen Lake, Half Way Creek, and their tributaries drain northeasterly into the Lake Champlain watershed and eventually into the St. Lawrence River.

Water Supply

Ground water of good quality is obtainable in sufficient quantities for individual home use in most places in the county. Generally, rural areas or areas outside of the larger population centers rely on individual drilled wells for a source of water. Some homes have shallow wells dug by hand or have developed springs.

In towns that have a municipal system, the water source is drilled wells or reservoirs. Several towns use both water sources. The town of Queensbury obtains water from the Hudson River.

History

Warren County was formed in 1813 when Washington County was separated into two parts. The county was named after Dr. Joseph Warren, a participant in the American Revolution. The first settlers moved into the area now known as Queensbury, in 1763, shortly after the French and Indian War *(17)*.

Lumbering and manufacturing wood products, which have existed in the county since its beginning, are two of the main enterprises. Tourists in large numbers are attracted to the recreation opportunities in the county. Garnet mining is an important industry. Before the turn of the century more than 2,000 farms were in the county. At present fewer than 70 farms are in existence. The largest farming area is in the town of Queensbury.

Transportation and Industry

The county has a variety of transportation facilities. Interstate 87 runs north and south through the county. About 180 miles of state highways, 240 miles of county highways, and 640 miles of town highways are in the county.

Regularly scheduled railroad passenger service is not available in the county, but rail connections can be made in the village of Fort Edward in Washington County. Railroad freight service is available in parts of the county. Trucking firms are located in several places in the county. Two bus lines provide service in the county. Warren County Airport, located east of Glens Falls, provides commuter service.

The two main enterprises are paper products and tourism. Timber is harvested and the wood is processed into paper products. Tourism is also important to the economy of the county. The many tourist accomodations and the variety of tourist activities provide seasonal and year-round employment. Some of the other large employers in the county are insurance companies, the Glens Falls Hospital, and Barton Mines.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material has few or no roots or other living organisms and has been changed very little by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape (fig. 1). By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil

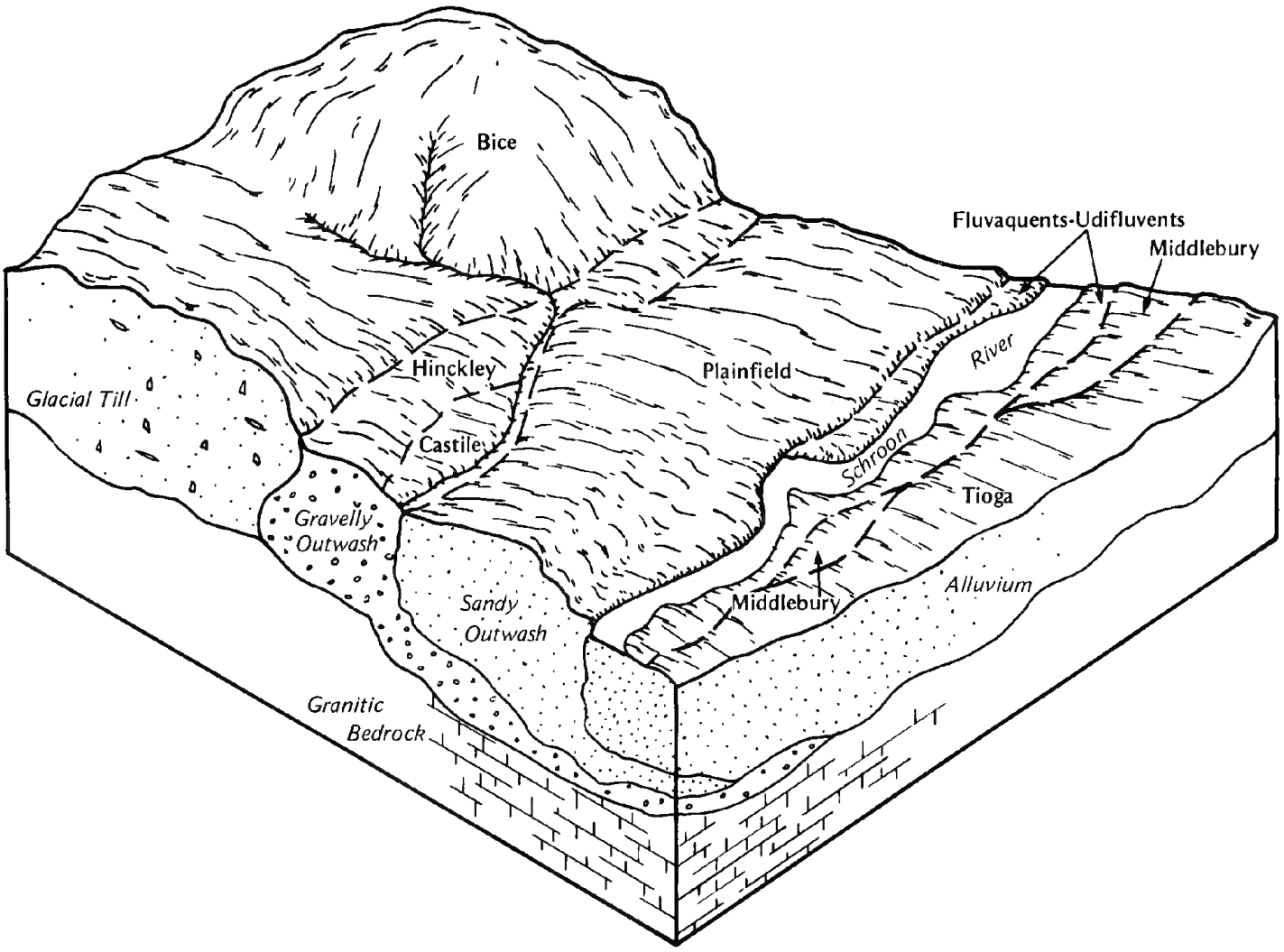


Figure 1.—Typical relationship of upland and valley soils to landscape position and underlying deposits near the Schroon River.

scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the

same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general soil map units in Warren County are described on the following pages. The texture in the descriptive heading of each general soil map unit refers to the surface layer of the major soils in that map unit. The drainage class also refers only to the major soils. Some map units include soils that are less sloping or more sloping than the legend indicates. The slope range for the map unit is given in the text.

A general soil map has been published for the county adjacent to Warren County, Washington County *(13)*. In some areas the names of adjoining map units are not exactly the same because the proportions of major soils differ from one survey area to another. Also, the concepts and names of some soil series have changed as a result of changes in the taxonomic system made since the publication of the earlier survey. The matching of adjoining units is not exact because of differences in the scale of maps in the two survey areas.

Soil Descriptions

1. Bice-Woodstock

Sloping to steep, deep and shallow, well drained to excessively drained, moderately coarse textured soils; on uplands at an elevation of about 1,000 to 1,500 feet

This map unit consists of soils that formed in glacial till derived from granite schist, and gneiss bedrock (fig. 2). Slope ranges from 3 to 45 percent but is dominantly 8 to 35 percent.

This map unit takes in 49.5 percent of the county. It is about 54 percent Bice soils, 12 percent Woodstock soils, and 34 percent soils of minor extent.

Bice soils are deep, gently sloping to steep, well drained, and dominantly moderately coarse textured. They are on valley sides, hillsides, and hilltops. Permeability, or the rate of water movement through the soils, is moderate or moderately rapid. In most areas large stones and boulders are on the surface.

Woodstock soils are shallow, gently sloping to steep, somewhat excessively drained and excessively drained, and moderately coarse textured. They are commonly on the upper part of hillsides, on hilltops, and on valley sides. Bedrock is at a depth of 10 to 20 inches. Permeability, or the rate of water movement through the soils, is moderate or moderately rapid. In many areas bedrock crops out on the surface, and in most places stones and boulders are on the surface.

The soils of minor extent are Stowe, Schroon, Lyme, Hinckley, Plainfield, Cathro, and Greenwood soils. Stowe soils are deep and have a dense layer in the subsoil. Schroon soils are similar to Bice soils except they are moderately well drained. Lyme soils are poorly drained and are in the low, wet areas that receive subsurface seepage and surface runoff from Bice and Woodstock soils. Hinckley and Plainfield soils are deep, excessively drained, and on the gravelly and sandy outwash plains in small valley areas. Hinckley and Plainfield soils are generally along the lower slopes near terraces and benches at the edges of the map unit. A few areas of the very poorly drained, organic Cathro and Greenwood soils are in low depressions. Hilltops and steep valley sides commonly have a higher percentage of very shallow soils and rock outcrops.

Most areas of the soils in this map unit are woodland. Many areas that had been cleared for farming are reverting to woodland, are idle fields, or are used for pasture. The main limitation to farming is the relatively short growing season at elevations generally of 1,000 to 1,500 feet. Other limitations to farming are droughtiness and in places slope, rock outcrops, and stones and boulders on the surface. Some areas are in recreation and urban uses. Many areas are limited for these uses by large stones on the surface, rock outcrops, slope, and shallow soils. Potential productivity for trees in most areas of these soils is moderately high. In places large

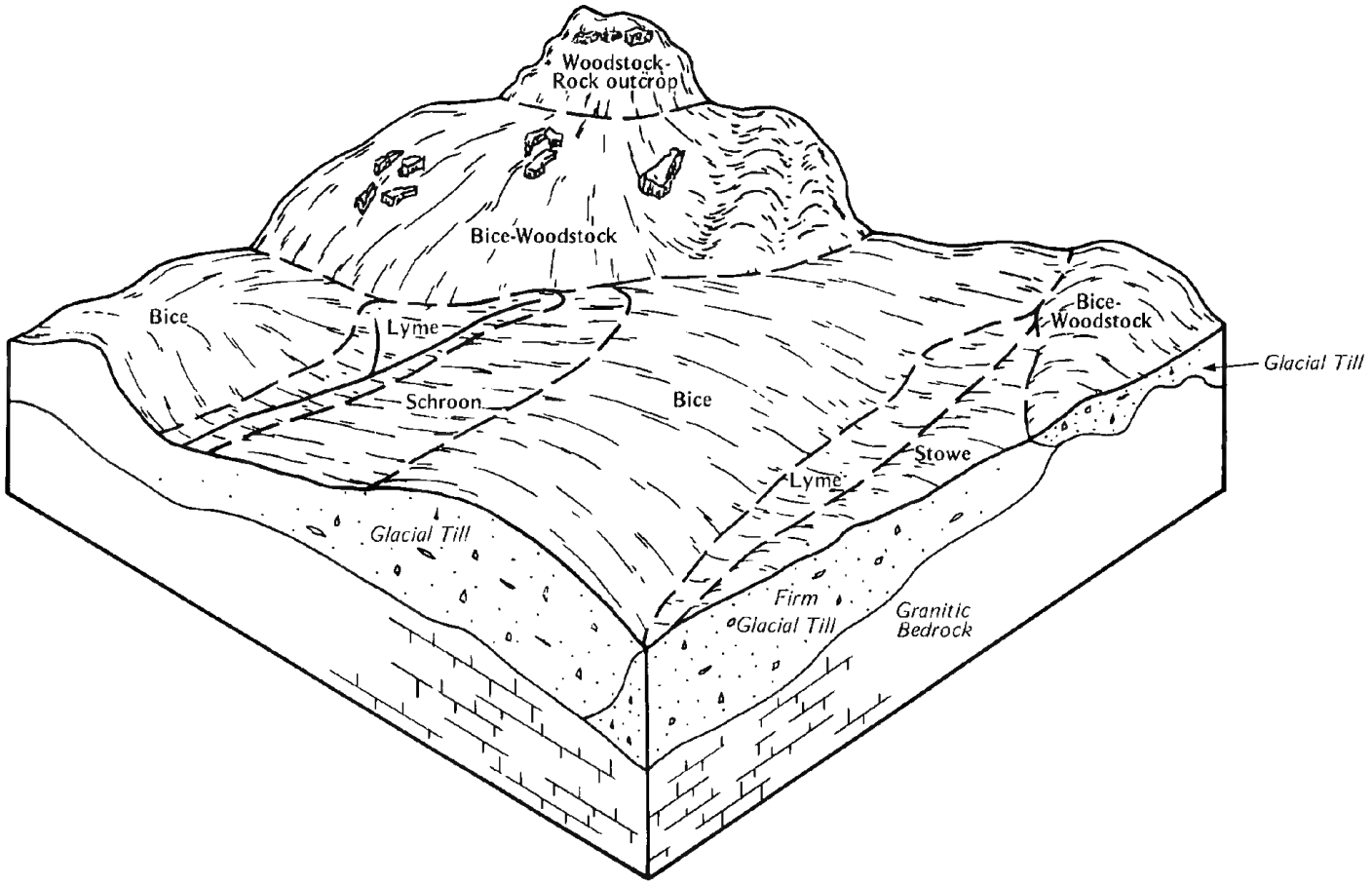


Figure 2.—Typical relationship of soils and underlying deposits in the Bice-Woodstock general soil map unit, which is generally at an elevation of about 1,000 to 1,500 feet.

stones, slope, and rock outcrops limit the use of equipment for harvesting timber and planting seedlings.

2. Herman-Marlow

Sloping to steep, deep, somewhat excessively drained and well drained, moderately coarse textured soils; on uplands at an elevation higher than about 1,500 feet

This map unit consists of soils that formed in glacial till derived from granite and gneiss bedrock (fig. 3). It is at the highest elevations in the county. Slope ranges from 3 to 45 percent, but is dominantly 8 to 35 percent.

This map unit takes in about 35 percent of the county. It is about 40 percent Hermon soils, 25 percent Marlow soils, and 35 percent soils of minor extent.

Hermon soils are deep and well drained and somewhat excessively drained. They are on mountaintops, mountainsides, hillsides, and hillcrests. The subsoil is moderately coarse textured. The substratum is coarse textured. Permeability, or the rate of water movement through the soils, is rapid. In most areas numerous stones and boulders are on the surface. In many areas bedrock crops out on the surface.

Marlow soils are deep, well drained, and moderately coarse textured or medium textured throughout. They are

on mountainsides, hillsides, and hill crests. A firm, compact layer 18 to 36 inches below the surface restricts the root zone and causes a perched seasonal high water table in early spring. Permeability, or the rate of water movement through the soils, is moderate above the fragipan and slow or moderately slow in the dense substratum. Numerous stones and boulders are generally on the surface.

The soils of minor extent are Lyman, Peru, Lyme, Bice, Cathro, and Greenwoood soils. Also included are areas of rock outcrops. Lyman soils are shallow and well drained and are commonly near Hermon soils. Peru soils are moderately well drained and on foot slopes and in gently sloping areas. Lyme soils are poorly drained to somewhat poorly drained and in low, wet areas. Bice soils are at a lower elevation, generally below 1,500 feet, where this map unit merges with the Bice-Woodstock map unit. The organic Cathro and Greenwood soils are in some of the lowest depressions on the landscape. Areas of rock outcrops are on hilltops and steep mountainsides.

The soils in this map unit are used mainly for woodland. Some areas had been cleared for farming but most of these cleared areas have reverted to woodland, are idle fields, or, in a few areas, are used as pasture. The main limitations to farming are the very short growing season, stones and boulders on the surface, rock outcrops, acid soil conditions, and, in places, slope and droughtiness. These soils are moderately suited to some recreation uses, such as camp sites and picnic

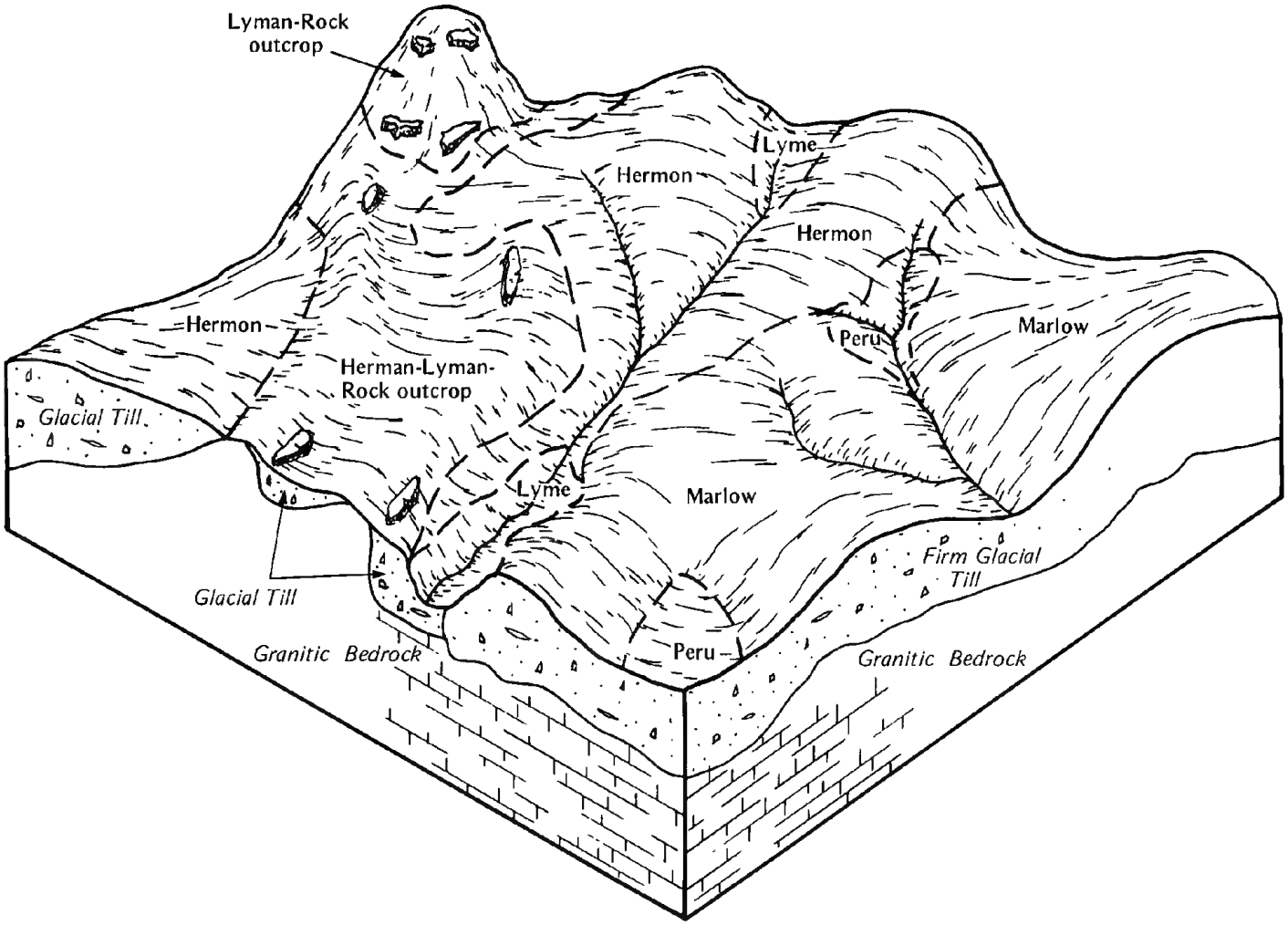


Figure 3.—Typical reltationship of soils and underlying deposits in the Hermon-Marlow general soil map unit, which is generally at an elevation above 1,500 feet.

areas, particularly in less sloping areas. Hiking paths and trails are throughout this map unit. The main limitations to urban use are stones and boulders on the surface, rock outcrops, slope, and slow permeability in the substratum in Marlow soils. Potential productivity for trees on these soils is moderate or moderately high. Numerous stones and boulders on the surface and, in many places, slope limit the use of equipment for harvesting timber and planting seedlings.

3. Charlton

Gently sloping, deep, well drained, moderately coarse textured soils; on uplands at an elevation lower than about 1,000 feet

This map unit consists of soils that formed in glacial till derived from gneiss, schist, and slate bedrock. In places these soils overlie limestone bedrock in the southeast corner of the town of Queensbury. Slope ranges from 3 to 25 percent, but is dominantly 3 to 8 percent.

This map unit takes in about 1.5 percent of the county. It is about 60 percent Charlton soils and 40 percent soils of minor extent.

Charlton soils are deep, well drained, and moderately coarse textured or medium textured in the subsoil. Permeability, or the rate of water movement through the soils, is moderately rapid or moderate. They are on convex hillsides, hilltops, knolls and valley sides.

The soils of minor extent are Paxton, Bice, Sutton, Woodbridge, Massena, Galway, Farmington, Oakville, and Hinckley soils. Paxton soils are well drained and on similar landforms as Charlton soils, but have a dense substratum. Bice soils are well drained and in colder areas than Charlton soils, above an elevation of 1,000 feet. Sutton and Woodbridge soils are moderately well drained on foot slopes and along drainageways. In addition, Woodbridge soils have a dense substratum. Massena soils are poorly drained to somewhat poorly drained and in wet areas along drainageways and in depressions. Also included are poorly drained soils that have a firm dense substratum. Galway soils are moderately deep, and Farmington soils are shallow. These soils both overlie limestone bedrock mainly in the southeast corner of the town of Queensbury. Oakville soils are on sand plains, and Hinckley soils are on gravelly terraces.

Most areas of the soils in this map unit are used for farming or woodland. Several areas are also in urban use. Areas that have been cleared of stones are suited to farming, but some of these areas have reverted to woodland or are idle. These soils are suited to most recreation and urban uses, especially in gently sloping areas. Potential productivity for trees on these soils is moderate. There are few limitations to managing these soils for woodland.

4. Hinckley-Plainfield

Gently sloping and sloping, deep, excessively drained, moderately coarse textured and coarse textured soils; on outwash plains

This map unit consists of soils that formed in water-sorted sand and gravel deposits on benches, terraces, and outwash plains. Slope ranges from 0 to 45 percent, but is dominantly 3 to 15 percent.

This map unit takes in about 9 percent of the county. It is about 50 percent Hinckley soils, 30 percent Plainfield soils, and 20 percent soils of minor extent.

Hinckley soils are deep, nearly level to steep, excessively drained, and coarse textured in the subsoil and the substratum. They are on terraces and benches in valleys and on outwash plains. Permeability, or the rate of water movement through the soils, is rapid or very rapid.

Plainfield soils are deep, nearly level to steep, excessively drained, and coarse textured throughout. They are on similar landforms as Hinckley soils, on terraces and outwash plains. Generally, no gravel is in the soils. Permeability, or the rate of water movement through the soils, is rapid.

The soils of minor extent are Castile, Elnora, Wareham, Bice, Charlton, Oakville, Tioga, and Middlebury soils, Fluvaquents, and Udifluvents. Castile and Elnora soils are moderately well drained and on foot slopes and in other low areas. Wareham soils are somewhat poorly drained and poorly drained and in low, depressional areas. Bice and Charlton soils are well drained and loamy. Bice soils generally are at a higher elevation, above about 1,000 feet. Charlton soils are below 1,000 feet in elevation. Oakville soils are commonly near Plainfield soils. Tioga soils are well drained, Middlebury soils are moderately well drained and somewhat poorly drained, and Fluvaquents and Udifluvents are intermixed. These four soils are in areas where this map unit crosses stream valleys.

Several areas of the soils in this map unit that had been cleared for agriculture have reverted to woodland or are idle. Other areas are in recreation and urban uses, and some small areas are used for farming. Cultivation is limited by droughtiness, the high content of gravel and cobbles in Hinckley soils, low natural fertility, and, in some places, slope. Many areas are suited to recreation use, but rock fragments limit Hinckley soils for many uses. These soils are well suited to most urban uses. Ground water contamination is a hazard if these soils are used for sanitary waste disposal systems because the soils are poor filters of effluent. Potential productivity for trees on these soils is low or moderate because of droughtiness. Many areas of these soils are a probable source of sand and gravel.

5. Oakville

Nearly level and gently sloping, deep, well drained, coarse textured soils; on outwash plains

This map unit consists of soils that formed in sandy outwash deposits on terraces and plains. Slope ranges from 0 to 15 percent, but is dominantly 0 to 8 percent.

This map unit takes in about 4 percent of the county. It is about 70 percent Oakville soils and 30 percent soils of minor extent.

Oakville soils are deep, well drained, and coarse textured. Permeability, or the rate of water movement through the soils, is rapid.

The soils of minor extent are Hartland, Hinckley, Elnora, Wareham, and Palms soils. Hartland soils are on benches and have a high silt content and low sand content. Hinckley soils have a high gravel content in the subsoil and the substratum. Elnora soils are moderately well drained and in low areas and along drainageways. Wareham soils are poorly drained and somewhat poorly drained and in a few low depressions. The organic Palms soils are in a few deep depressions. Some areas of soils that are shallow to limestone bedrock are in the southeast corner of the town of Queensbury.

Many areas of the soils in this map unit are in urban use some areas are used for farming. Many areas that had been cleared have reverted to woodland.

These soils are moderately suited to crop production because of low natural fertility and droughtiness. They are well suited to most recreation and urban uses except where limited by slope. Lawns and sod cover are commonly difficult to establish because of the sandy texture and droughtiness. Potential productivity for trees on these soils is moderately high. Seedling mortality is high, especially in dry years. These soils are generally a good source of sand.

6. Carlisle-Madalin-Hudson-Rhinebeck

Nearly level, deep, very poorly drained, organic soils; in bogs and swamps; and nearly level to sloping, deep, very poorly drained to moderately well drained, medium textured, mineral soils; on lake plains

This map unit consists of soils that formed in organic deposits in very low areas and soils that formed in lake-laid silt and clay deposits on low plains. The landscape is dominantly broad, flat areas where slope is less than 3 percent, but it includes dissected areas and ridges where slope is as much as 15 percent.

This map unit takes in about 1 percent of the county. It is about 17 percent Carlisle soils, 16 percent Madalin soils, 13 percent Hudson soils, 10 percent Rhinebeck soils, and 44 percent soils of minor extent.

Carlisle soils are deep, nearly level, very poorly drained, well decomposed muck. They are in low-lying depressions. They formed in organic deposits more than 51 inches thick. Permeability, or the rate of water movement through the soils, ranges from moderately rapid to moderately slow. The seasonal high water table is at or near the soil surface for prolonged periods during the year.

Madalin soils are deep, nearly level, poorly drained and very poorly drained, and fine textured or moderately fine textured in the subsoil. They are in low-lying areas. Permeability, or the rate of water movement through the soils, is slow in the subsoil. The seasonal high water table is near the soil surface much of the year.

Hudson soils are deep, gently sloping or sloping, moderately well drained, and fine textured or moderately fine textured in the subsoil. They are on knolls, ridges, or dissected side slopes. Permeability, or the rate of water movement through the soils, is slow or very slow in the subsoil and the substratum.

Rhinebeck soils are deep, nearly level or gently sloping, somewhat poorly drained, and fine textured or moderately fine textured in the subsoil. Permeability, or the rate of water movement through soils, is slow in the subsoil and the substratum. The seasonal high water table is in the subsoil in spring.

The soils of minor extent are Saprists, Aquepts, and Elmridge, Shaker, Belgrade, Wareham, and Palms soils. Saprists and Aquepts are generally covered with shallow water and are near Carlisle soils. Elmridge soils are moderately well drained, and Shaker soils are poorly drained; these soils are in areas where loamy soil material overlies clayey deposits. Belgrade soils are moderately well drained and in areas where the content of silt and very fine sand in the subsoil and the substratum is high. Wareham soils are poorly drained and somewhat poorly drained and in low-lying or depressional areas similar to those of Madalin soils. Palms soils are very poorly drained, organic, and in low, depressional, bog areas.

Many areas of the soils in this map unit are covered with marsh grasses, cattails, and water-tolerant trees and shrubs. Some of the better drained areas, particularly areas of Hudson and Rhinebeck soils, are used for cultivated crops. A few areas are in urban and recreation uses. If properly drained, many areas are suited to cultivated crops. Most undrained areas are too wet for cultivated crops. The seasonal high water table, low stability, and high humus content in the organic Carlisle soils and slow or very slow permeability in the mineral soils are serious limitations for most recreation and urban uses. Potential productivity for trees is high on Hudson soils, moderately high on Rhinebeck soils, moderate on Carlisle soils, and low on Madalin soils.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Oakville loamy fine sand, 0 to 3 percent slopes, is one of several phases in the Oakville series.

Some map units are made up of two or more major soils. These map units are called soil complexes or undifferentiated groups.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Hinckley-Plainfield complex, level, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in the mapped areas are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Cathro and Greenway mucks is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Dumps, mine, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

AgA—Agawam fine sandy loam, 0 to 3 percent slopes. This is a nearly level, deep, well drained soil on terraces, benches, and plains in valleys. Areas of the soil are 5 to 50 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 4 inches thick. The subsoil is fine sandy loam about 20 inches thick. In the upper part it is yellowish brown, and in the lower part it is light olive brown. The substratum is olive gray loamy fine sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of sandy Oakville soils, Hartland soils that have a high silt content, and gravelly Hinckley soils. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Agawam soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and the upper part of the subsoil, moderately rapid or rapid in the lower part of the subsoil, and rapid in the substratum. Surface runoff is slow. The

capacity of the soil to store water available for plants is moderate. Rock fragments make up 0 to 10 percent of the surface layer and the subsoil, 0 to 30 percent of the substratum above a depth of 40 inches, and 0 to 60 percent below that depth. In unlimed areas the surface layer is very strongly acid to slightly acid.

Most areas of this soil are idle or forested. Some areas are used for cultivated crops and building sites.

This soil is well suited to many recreation and urban uses. Most areas have suitable sites for picnic areas, campgrounds, paths and trails, and dwellings. Some areas have suitable sites for athletic fields and other uses requiring level sites. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to the water table and, in some areas, seepage caused by the permeability of the soil. Ground water contamination is a hazard if the soil is used for septic tank absorption fields and other sanitary waste disposal systems because the soil is a poor filter of effluent.

Potential productivity for trees on this soil is moderately high. Planting seedlings when the soil is moist and removing brush help to improve the rate of seedling survival. Sugar maple, red oak, beech, yellow birch, and white pine are common on this soil.

This soil is well suited to the cultivated crops grown in the survey area and to pasture. Erosion is a slight hazard in areas unprotected by plant cover and in intensively cultivated areas. Cover crops or sod crops and a conservation tillage system that returns crop residue to the soil help to control erosion, to increase organic matter content, and to improve soil tilth. Crops respond well to lime and fertilizer, but in some years the soil tends to be droughty. Use of irrigation equipment is feasible.

This soil is in capability subclass I.

BaA—Belgrade silt loam, 0 to 3 percent slopes. This is a nearly level, deep, moderately well drained soil on terraces, benches, and foot slopes and in fan-shaped areas where small streams once entered main valleys. Areas of this soil are oval and range from 5 to 25 acres, but are more commonly 5 to 10 acres.

Typically, the surface layer is dark brown silt loam 10 inches thick. The subsoil is 12 inches thick. It is yellowish brown silt loam in the upper part and mottled, yellowish brown very fine sandy loam in the lower part. The substratum is mottled, brown very fine sandy loam to a depth of 42 inches. Below that, it is mottled, grayish brown loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hartland and Oakville soils on convex ridges and knolls and Raynham soils in low areas and along drainageways. Areas of included soils are 1 to 3 acres and make up less than 10 percent of the map unit.

The seasonal high water table in this Belgrade soil is at a depth of 1 1/2 to 3 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and subsoil and slow to moderately rapid in the substratum. Surface runoff is slow. The capacity of the soil to store water available for plants is high. Rock fragments make up 0 to 5 percent of the soil above a depth of 40 inches. In unlimed areas the surface layer and the subsoil are slightly acid to very strongly acid. The substratum is slightly acid or neutral.

Most areas of this soil have been cleared and are used for farming. Some areas are in recreation use, and a few areas are in urban use.

This soil is suited to many recreation and urban uses. Most areas have suitable sites for picnic areas, campgrounds, and playgrounds. The main limitation is the seasonal high water table. The main limitation to use of the soil as sites for dwellings with basements and for septic tank absorption fields is also the seasonal high water table. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to the water table in midsummer and poor stability of the soil for dams and embankments.

Potential productivity for trees on this soil is moderately high. The seasonal high water table in early spring and in rainy periods during the rest of year somewhat limits the use of equipment. Water-tolerant trees grow well on the soil. Removing brush helps to improve the rate of seedling survival. White pine and red oak are common on this soil.

This soil is well suited to many cultivated crops grown in the region, but in some years the seasonal high water table delays planting in early spring. Erosion is a slight hazard in areas where slope is long and more than 2 percent and in areas unprotected by plant cover. Cover crops or sod crops and a conservation tillage system that returns crop residue to the soil help to control erosion, to increase organic matter content, and to improve soil tilth. Crops respond well to lime and fertilizer. In pasture management the main concern is surface compaction caused by grazing when the soil is too wet. Deferred grazing in spring and during wet periods helps to maintain a good sod cover. Suitable management practices are pasture rotation, annual mowing, and applications of lime and fertilizer.

This soil is in capability subclass IIw.

BaB—Belgrade silt loam, 3 to 8 percent slopes. This is a gently sloping, deep, moderately well drained soil on undulating benches, terraces, and fan-shaped areas where small streams once entered main valleys. Areas of this soil are oval and range from 5 to 30 acres, but are more commonly 5 to 10 acres.

Typically, the surface layer is dark brown silt loam about 10 inches thick. The subsoil is about 12 inches thick. It is yellowish brown silt loam in the upper part and mottled, yellowish brown very fine sandy loam in the lower part. The substratum extends to a depth of 60 inches or more. It is mottled, brown very fine sandy loam

to a depth of about 42 inches. Below that, it is mottled, grayish brown loamy sand.

Included with this soil in mapping are small areas of Hartland and Oakville soils on convex knolls and Raynham soils in low spots and along drainageways. Areas of included soils are 1 to 3 acres and make up less than 10 percent of the map unit.

The seasonal high water table in this Belgrade soil is at a depth of 1 1/2 to 3 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and subsoil and slow to moderately rapid in the lower part of the substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plants is high. Rock fragments make up 0 to 5 percent of the soil above a depth of 40 inches. In unlimed areas the surface layer and the subsoil are slightly acid to very strongly acid. The substratum is slightly acid or neutral.

Most areas of this soil have been cleared and are used for farming. Some areas are in recreation use, and a few areas are in urban use.

This soil is suited to many recreation and urban uses. Most areas have suitable sites for picnic areas, campgrounds, and paths and trails. Slope and the seasonal high water table limit use of the soil for playgrounds. The seasonal high water table limits use of the soil as sites for dwellings with basements and for septic tank absorption fields. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to the water table in midsummer and because the soil is subject to piping and seepage in dams and embankments.

Potential productivity for trees on this soil is moderately high. The seasonal high water table in early spring and in rainy periods during the rest of the year somewhat limits the use of equipment. Water-tolerant trees grow well on the soil. Removing brush helps to improve the rate of seedling survival. White pine and red oak are common on this soil.

This soil is well suited to many cultivated crops grown in the region, but in some years the seasonal high water table delays planting in spring. Erosion is a serious hazard in areas where slope is long and in areas unprotected by plant cover. Suitable management practices are contour farming, use of cover crops or sod crops, and a conservation tillage system that returns crop residue to the soil. These practices help to control erosion, to increase organic matter content, and to improve soil tilth. Crops respond well to lime and fertilizer. In pasture management the main concern is surface compaction caused by grazing when the soil is too wet. Deferred grazing in spring and during wet periods helps to maintain a good sod cover and to prevent surface compaction. Suitable management practices are pasture rotation, annual mowing, and applications of lime and fertilizer.

This soil is in capability subclass IIe.

BcB—Bice fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, well drained soil on smooth hilltops and hillsides on uplands. Areas of the soil are oval to rectangular and range from 5 to 50 acres.

Typically, the surface layer is covered with litter. The surface layer is light brownish gray fine sandy loam about 3 inches thick. The subsoil is strong brown, yellowish brown, and olive brown fine sandy loam about 19 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Schroon and Lyme soils in nearly level areas, on concave foot slopes, along drainageways, and in depressions. Also included in some units are areas of somewhat poorly drained soils. Also included are a few areas of Stowe soils, which have a firm, dense substratum, and Woodstock soils, which are shallow to bedrock. Also included, at elevations above 1,000 feet, are areas of Hermon soils. Also included are scattered areas of rock outcrop and areas where stones and boulders are on the surface. Areas of included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Bice soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is medium. The capacity of the soil to store water available for plants is moderate. Rock fragments make up 5 to 30 percent of the surface layer and the subsoil. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil that had been cleared for farming have reverted to forestland and brushland. Some areas are used for recreation, and a few areas are used for crops.

This soil is suited to many recreation and urban uses. Most areas have suitable sites for picnic areas, campgrounds, paths and trails, and dwellings. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to the water table and, in some areas, seepage caused by the permeability of this soil.

Potential productivity for trees on this soil is moderate. Northern red oak and eastern white pine are common in wooded areas. White pine is commonly used in reforestation. Planting when the soil is moist in spring and removing brush help to improve the rate of seedling survival.

This soil is well suited to many cultivated crops grown in the region, but the crop varieties are restricted because of the relatively short growing season. Erosion is a hazard on long slopes and in areas unprotected by plant cover. Suitable management practices are contour farming, use of cover crops or sod crops, and a

conservation tillage system that returns crop residue to the surface. These practices help to control erosion, to increase organic matter content, to improve soil tilth, and to conserve soil moisture. In places stones and boulders on the surface and occasional rock outcrops limit the use of machinery. Crops respond well to lime and fertilizer. In some years the soil is droughty.

This soil is in capability subclass IIe.

BcC—Bice fine sandy loam, 8 to 15 percent slopes. This is a sloping, deep, well drained soil on smooth, convex hilltops and hillsides on uplands. Areas of the soil are oval to rectangular and range from 5 to 75 acres.

Typically, the surface layer is covered with a thin layer of leaf litter. The surface layer is light brownish gray fine sandy loam about 3 inches thick. The subsoil is strong brown, yellowish brown, and olive brown fine sandy loam about 19 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Schroon and Lyme soils on foot slopes, in depressions, and along drainageways. Also included in some map units are areas of somewhat poorly drained soils. Also included are a few areas of Stowe soils that have a firm, dense substratum and Woodstock soils that are shallow to bedrock. Also included, at elevations above 1,000 feet, are areas of Hermon soils. Also included are scattered areas of rock outcrop and areas where stones and boulders are on the surface. Areas of included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Bice soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is medium to rapid. The capacity of the soil to store water available for plants is moderate. Rock fragments make up 5 to 30 percent of the surface layer and the subsoil. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil that had been cleared for farming have reverted to forestland and brushland. Some areas are used for recreation, and a few areas are used for crops.

This soil is moderately suited to some recreation and urban uses. Most areas have suitable sites for picnic areas, campgrounds, and dwellings. The main limitation for these uses is slope. Ponds and habitat for wetland wildlife are difficult to develop because of slope, the depth to the water table, and, in some areas, seepage caused by the permeability of this soil.

Potential productivity for trees on this soil is moderate. Northern red oak and eastern white pine are common in wooded areas. White pine is commonly planted in reforestation. Planting when the soil is moist in spring and removing brush help to improve the rate of seedling survival.

This soil is suited to many cultivated crops grown in the region, but the crop varieties are restricted because of the relatively short growing season. ErosioP is a serious hazard in areas where slope is long, and in areas unprotected by plant cover. Suitable management practices are contour farming, use of cover crops or sod crops, and a conservation tillage system that returns crop residue to the surface. These practices help to control erosion, to increase organic matter content, to improve soil tilth, and to conserve moisture. Crops respond well to lime and fertilizer, but in some years the soil is droughty. In places stones and boulders on the surface and occasional rock outcrops limit the use of machinery.

This soil is in capability subclass IIIe.

BcD—Bice fine sandy loam, 15 to 25 percent slopes. This is a moderately steep, deep, and well drained soil on hillsides and narrow valley sides on uplands. Areas of the soil are oval or rectangular and range from 5 to 30 acres.

Typically, the surface layer is covered with a thin layer of decomposed leaf litter. The surface layer is light brownish gray fine sandy loam about 3 inches thick. The subsoil is strong brown, yellowish brown, and olive brown fine sandy loam about 19 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Schroon and Lyme soils on foot slopes and along drainageways. Also included in some map units are areas of somewhat poorly drained soils. Also included are a few areas of Stowe soils that have a firm, dense substratum and Woodstock soils that are shallow to bedrock. Also included, at elevations above 1,000 feet, are areas of Herman soils and, at the foot of slopes, areas where many stones and boulders are common on the surface. Also included are scattered areas of rock outcrop and areas where stones and boulders are on the surface. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Bice soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is rapid. The capacity of the soil to store water available for plants is moderate. Rock fragments make up 5 to 30 percent of the surface layer and the subsoil. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil that had been cleared for farming have reverted to forestland and brushland. Some areas are used for recreation, and a few areas are used for pasture or hay.

The main limitation of this soil for recreation and urban uses is slope. Ponds and habitat for wetland wildlife are difficult to develop because of slope, the depth to the water table, and, in some areas, seepage caused by the permeability of this soil.

Potential productivity for trees on this soil is moderate. Slope limits the use of harvesting equipment. Northern red oak and eastern white pine are common on this soil. White pine is commonly planted in reforestation. Planting when the soil is moist in early spring and removing brush help to improve the rate of seedling survival.

This soil is moderately suited to some cultivated crops, particularly sod crops, grown in the region, but the crop varieties are restricted because of the relatively short growing season. Slope causes a very serious erosion hazard and restricts the use of equipment. A long-term sod cover for hay or pasture helps to control erosion. In some areas stones and boulders on the surface and occasional rock outcrops limit the use of machinery.

This soil is in capability subclass IVe.

BdC—Bice very bouldery fine sandy loam, sloping. This is a deep, well drained soil in wooded areas on hillsides and hill crests on uplands. Boulders and stones about 5 to 30 feet apart are on the surface. Most areas are oval or rectangular and range from 10 to more than 100 acres. Slope ranges from 3 to 15 percent, but are dominantly 5 to 12 percent.

Typically, the surface layer is covered with a thin, decomposed leaf litter. The surface layer is light brownish gray fine sandy loam about 3 inches thick. The subsoil is strong brown, yellowish brown, and olive brown fine sandy loam about 19 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Schroon soils on foot slopes and Lyme soils in depressions and along drainageways. Also included in some map units are areas of somewhat poorly drained soils. Also included are a few areas of Stowe soils that have a firm, dense substratum and Woodstock soils that are shallow to bedrock. Also included are areas of Plainfield and Hinckley soils and, in a few places, scattered areas of rock outcrop. Also included are areas of Bice soils where few or no boulders or stones are on the surface. Areas of included soils are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Bice soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is medium or rapid. The capacity of the soil to store water available for plants is moderate. Rock fragments make up 5 to 30 percent of the surface layer and the subsoil. In unlimed areas the surface layer is strongly acid to moderately acid.

Most areas of this soil are forested. Areas that had been cleared of trees for farming have reverted to forest. Some areas are used for recreation or community development.

This soil is suited to use as sites for campgrounds, picnic areas, paths and trails, and dwellings. The main limitations to these uses are slope and the large number of boulders and stones on the surface. Ponds and habitat for wetland wildlife are difficult to develop because of slope, the depth to the water table, and, in some areas, seepage caused by the permeability of this soil.

Potential productivity for trees on this soil is moderate. Red oak and white pine are common on this soil. White pine is commonly planted in reforestation. Planting when the soil is moist in early spring and removing brush help to improve the rate of seedling survival. In some areas large boulders on the surface limit the use of equipment.

This soil is not suited to cultivated crops because of the short growing season and boulders and stones on the surface. Numerous boulders prohibit the use of typical farm equipment. Some areas that have been cleared of trees are suited to pasture, although the boulders impede reseeding and applying lime and fertilizer.

This soil is in capability subclass VIs.

BdE—Bice very bouldery fine sandy loam, steep. This is a deep, well drained soil on wooded hillsides and narrow valley sides on uplands. Boulders and stones about 5 to 30 feet apart are on the surface. Most areas are oval to rectangular and range from 10 to more than 100 acres. Slope ranges from 15 to 45 percent, but are dominantly 25 to 35 percent.

Typically, the surface layer is covered with a thin, decomposed leaf litter. The surface layer is light brownish gray fine sandy loam about 3 inches thick. The subsoil is strong brown, yellowish brown, and olive brown fine sandy loam about 19 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Schroon soils on foot slopes and Lyme soils in depressions and along drainageways. Also included in some map units are areas of somewhat poorly drained soils. Also included are a few areas of Stowe soils that have a firm, dense substratum and Woodstock soils that are shallow to bedrock. Also included are areas of Plainfield and Hinckley soils and in a few places, scattered areas of rock outcrop. Also included are Bice soils where few or no boulders or stones are on the surface. Areas of included soils are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Bice soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately

rapid. Surface runoff is rapid. The capacity of the soil to store water available for plants is moderate. Rock fragments make up 5 to 30 percent of the surface layer and the subsoil. In unlimed areas the surface layer is strongly acid or moderately acid.

Most areas of this soil are forested. A few areas are in recreation use.

Slope limits the recreation use of this soil to hiking paths and trails and ski slopes. Slope also limits this soil for urban uses, such as building sites and local roads and streets. In addition, boulders and stones are also limitations to these uses.

Potential productivity for trees on this soil is moderate. Slope and stones on the surface limit the use of equipment. Erosion is a hazard on logging trails. Proper design and construction of logging roads and skid trails help to control erosion. Red oak and white pine are common on this soil. White pine is commonly planted in reforestation. Planting when the soil is moist in early spring and removing brush help to improve the rate of seedling survival.

This soil is not suited to cultivated crops because of slope, stones and boulders on the surface, and the short growing season. If cleared of trees, some areas are suited to pasture.

This soil is in capability subclass VIIs.

BeC—Bice-Woodstock very bouldery fine sandy loams, sloping. This map unit consists of the deep, well drained Bice soil and the shallow, excessively drained or somewhat excessively drained Woodstock soil. It is about 50 percent Bice soil, 30 percent Woodstock soil, and 20 percent other soils. It is on hillsides and hillcrests on uplands. Areas are mostly oval or rectangular and 10 to more than 100 acres. Boulders and stones 5 to 30 feet apart are on the surface. Slope ranges from 3 to 15 percent, but are dominantly 8 to 15 percent. Bice and Woodstock soils are in such an intricate pattern on the landscape that they could not be separated at the scale selected for mapping.

Typically, the surface layer of the Bice soil is covered by a thin layer of decomposed leaf litter. The surface layer is light brownish gray fine sandy loam about 3 inches thick. The subsoil is strong brown, yellowish brown, and olive brown fine sandy loam about 19 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Woodstock soil is covered by a thin layer of decomposed leaf litter. The surface layer is very dark grayish brown fine sandy loam about 2 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam about 16 inches thick. Granite bedrock is at a depth of 18 inches.

Included with this unit in mapping are soils that are less than 10 inches deep and soils that are 20 to 40 inches deep to bedrock. Also included are areas of Stowe soils, which have a firm, dense layer at a depth of 16 to 33 inches. Also included are areas of Schroon and Lyme soils in some depressions and drainageways and a few areas that do not have boulders and stones on the surface. Also included, in some places, are scattered areas of rock outcrop. Areas of included soils are as much as 10 acres, and make up 15 percent of the map unit.

The seasonal high water table in the Bice soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is medium. The capacity of the soil to store water available for plants is moderate. Rock fragments make up 5 to 30 percent of the surface layer and the subsoil. In unlimed areas the surface layer is very strongly acid to moderately acid.

The seasonal high water table in the Woodstock soil is not within a depth of 6 feet of the soil surface. Bedrock is at a depth of 10 to 20 inches. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and the subsoil. Surface runoff is medium. The capacity of the soil to store water available for plant growth is low. Rock fragments make up 5 to 25 percent of the soil. In unlimed areas the surface layer is strongly acid to slightly acid.

Most areas of the soils in this map unit are forested. A few areas had been cleared for pasture, but most have reverted to forest and brush. Some areas are used for recreation, and a few are still used for pasture.

These soils, particularly the Bice soil, are suited to some recreation uses. The main limitations are slope and stones and boulders on the surface. For most urban uses, onsite investigation is needed to determine slope, depth to bedrock, and amount of boulders and stones on the surface. Depth to bedrock in the Woodstock soil is a serious limitation to excavations. Ponds and habitat for wetland wildlife are difficult to develop because of depth to the water table, depth to bedrock in the Woodstock soil, slope, and in some areas, seepage, which can be caused by the permeability of these soils.

Potential productivity for trees on these soils is moderate. Red oak, yellow birch, and white pine are common on these soils. On the Woodstock soil, windthrow is a problem because of the shallow root zone. Boulders and stones limit the use of equipment for planting seedlings. Planting when the soils are moist in early spring and removing brush help to improve the rate of seedling survival, particularly on the Woodstock soil.

These soils are not suited to crops because of the short growing season and boulders on the surface. On the Woodstock soil bedrock limits the use of equipment. In some areas the soils are suitable for pasture, but boulders and stones limit reseeding and applying fertilizer. On the Woodstock soil, droughtiness limits plant growth.

This soil is in capability subclass VIs.

BeE—Bice-Woodstock very bouldery fine sandy loams, steep. This map unit consists of the deep, well drained Bice soil and the shallow, excessively drained or somewhat excessively drained Woodstock soil. It is about 50 percent Bice soil, 30 percent Woodstock soil, and 20 percent other soils. It is on hillsides and valley sides on uplands. Areas are mostly oval or rectangular and 10 to more than 100 acres. Bice and Woodstock soils are in such an intricate pattern on some parts of the landscape that they could not be separated at the scale selected for mapping. Boulders and stones about 25 to 30 feet apart are on the surface. Slope ranges from 15 to 45 percent, but is dominantly 20 to 30 percent.

Typically, the surface layer of the Bice soil is covered with a thin layer of decomposed leaf litter. The surface layer is light brownish gray fine sandy loam about 3 inches thick. The subsoil is strong brown, yellowish brown, and olive brown fine sandy loam about 19 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Typically, the surface layer of the Woodstock soil is covered with a thin layer of decomposed leaf litter. The surface layer is very dark grayish brown fine sandy loam about 2 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam about 16 inches thick. Granite bedrock is at a depth of 18 inches.

Included with this unit in mapping are soils that are less than 10 inches deep and soils that are 20 to 40 inches deep to bedrock. Also included are areas of Stowe soils, which have a firm, dense layer at a depth of 16 to 33 inches, and Schroon and Lyme soils in depressions and drainageways. Also included are a few areas that do not have boulders or stones on the surface. Also included, in some places, are scattered areas of rock outcrop. Areas of included soils are as much as 10 acres and make up 15 percent of this map unit.

The seasonal high water table in the Bice soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through this soil, is moderate or moderately rapid. Surface runoff is rapid. The capacity of the soil to store water available for plants is moderate. Rock fragments make up 5 to 30 percent of the soil. In unlimed areas the surface layer is very strongly acid to moderately acid.

The seasonal high water table in the Woodstock soil is not within 6 feet of the surface. Bedrock is at a depth of 10 to 20 inches. Permeability, or the rate of water movement through the soil, is moderately rapid. Surface runoff is rapid. The capacity of the soil to store water available for plant growth is low. Rock fragments make up 5 to 25 percent of the soil. In unlimed areas the surface layer is strongly acid to slightly acid.

Most areas of the soils in this map unit are forested (fig. 6). The few areas that had been cleared for pasture have reverted to forest and brush. A few areas are used for recreation.

In most areas these soils are not suited to use as sites for recreation or urban uses because of slope, boulders on the surface, and depth to bedrock in the Woodstock soil. In the less sloping areas these soils are suited to use as hiking paths and trails.

Potential productivity for trees on these soils is moderate. On the Woodstock soil windthrow is a problem because of the shallow root zone. Slope and stones on the surface limit the use of equipment. In the steeper areas erosion is a hazard on logging trails. Laying out logging roads and skid trails on the contour helps to control erosion. Red oak, yellow birch, and white pine are common on these soils. White pine is commonly planted in reforestation.

These soils are not suited to cultivated crops because of the short growing season, slope, and boulders on the surface. If cleared of trees, small areas where slope is less than 25 percent are suited to pasture.

These soils are in capability subclass VIIs.

Ca—Carlisle muck. This is a level, very poorly drained, organic soil in wet, boggy areas that receive runoff from surrounding, higher landscapes. It is in depressions on uplands and on lowland plains. Most areas are oval and 5 to 100 acres. Slope ranges from 0 to 2 percent.

Typically, the uppermost 10 inches of the soil are black, well decomposed organic material. Below that, the soil is black and dark reddish brown, well decomposed organic material to a depth of 80 inches or more.

Included with these soils in mapping are small areas of Palms muck that is moderately deep to mineral material. Also included are areas of muck that have a higher percentage of undecomposed plant fibers than is typical for this Carlisle muck. Also included, in places, are the clayey Madalin soils. In upland areas small areas of Massena soils are included on benches and low knolls. Included areas are 1 to 3 acres and make up about 20 percent of the map unit.

The seasonal high water table in these Carlisle soils is at or near the soil surface for prolonged periods during the year. Some areas are ponded in spring. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soils, is moderately rapid to moderately slow. Surface runoff is very slow or ponded. The capacity of the soils to store water available for plants is very high. In unlimed areas the surface layer is moderately acid to neutral.

Most areas of these soils are in water-tolerant trees and brush. A few areas of these soils had been drained and used for truck crops. Most of these areas have been reverting to swamp grass and brush.

This soil is not suited to use as sites for recreation or community development because of the seasonal high water table and the high compressibility of the organic

material. Many areas are well suited to use as wildlife ponds and habitat for wetland wildlife.

Potential productivity for trees on this soil is moderate. The seasonal high water table restricts root growth; consequently, windthrow is a hazard. The use of equipment is limited. Seedling mortality is high. Seedlings that can withstand prolonged wetness are suitable on this soil. Red maple, white cedar, and red spruce are common on this soil.

This soil is not suited to cultivated crops grown in the region because of the seasonal high water table. Cleared areas are subject to subsidence and soil blowing. Windbreaks help to control soil blowing. Many areas are in frost pockets, which reduce the length of the growing season.

These soils are in capability subclass VIIw.

Ce—Castile gravelly fine sandy loam. This is a nearly level, deep, moderately well drained soil on moderately low terraces or benches or in slight depressions on nearly flat plains. Most areas are oval or round and range from 3 to 20 acres.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 8 inches thick. The subsoil is dark brown, yellowish brown, and grayish brown gravelly or very gravelly fine sandy loam about 24 inches thick. The substratum is dark grayish brown, stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hinckley, Oakville, and Plainfield soils. Also included are some small areas of sandy Elnora soils and areas of Wareham and Massena soils in depressions. A few included areas do not have a gravelly surface layer. Included areas are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Castile soil is at a depth of 1 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid in the surface layer, moderately rapid in the subsoil, and rapid or very rapid in the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is low. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil have been cleared for farming. Many areas have reverted to forest or brush or are idle meadows. A few areas are used for farming or recreation.

This soil is suited to most recreation uses. The main limitations to these uses are small stones and the seasonal high water table. The seasonal high water table limits most urban uses. The soil is a good source of roadfill and a probable source of sand and gravel. However, the seasonal high water table restricts the depth of mining pits. In some areas ponds and habitat for wetland wildlife are fairly difficult to develop because of seepage caused by the permeability in the substratum.

Potential productivity for trees on this soil is moderately high. In some years seedling mortality is a problem because of the low available water capacity. Planting when the soil is moist in early spring, removing brush, and selecting suitable varieties help to improve the rate of seedling survival. Sugar maple, red oak, and beech are common on this soil.

This soil is well suited to many cultivated crops grown in the region. The crop varieties are restricted and in many years planting is delayed because of the seasonal high water table in early spring. Subsurface drainage helps to improve conditions for early spring planting. In dry years the soil is droughty in midsummer. Crop residue mixed into the soil helps to increase organic matter content, to improve soil tilth, and to increase the water holding capacity of the soil. In some areas gravel fragments limit the use of equipment. Crops respond well to lime and fertilizer.

This soil is in capability subclass IIw.

Cg—Cathro and Greenwood mucks. This map unit consists of nearly level, deep, very poorly drained soils in depressions on uplands. Some areas of the map unit are mostly Cathro soils, some are mostly Greenwood soils, and some consist of both. The total acreage of the map unit is about 50 percent Cathro soils, 40 percent Greenwood soils, and 10 percent other soils. Most areas are irregular in shape and range from 10 to 100 acres. Slope is less than 2 percent. The Cathro and Greenwood soils were mapped together because they are similar in use and management.

Typically, the uppermost 4 inches of the Cathro soils are dark reddish brown, partly decomposed organic material. Below that, the soils are dark reddish brown and black, well decomposed organic material to a depth of about 46 inches. The substratum extends to a depth of 62 inches or more. It is mottled, dark grayish brown silt loam that grades to greenish gray very fine sandy loam in the lower part.

Typically, the uppermost 14 inches of the Greenwood soils are dark brown, partly decomposed sphagnum moss and roots. Below that, the soils are dark reddish brown and dark brown, partly decomposed organic material to a depth of 80 inches or more.

Included with these soils in mapping are small areas of Lyme soils and freshwater marsh and organic soils that are shallow to bedrock. The included areas are as much as 10 acres and make up about 10 percent of the map unit.

The seasonal high water table in the Cathro and Greenwood mucks is at or near the soil surface much of the year. Areas adjacent to lakes and ponds are frequently ponded in spring. Bedrock is generally at a depth of 60 inches or more. In the Cathro soils permeability, or the rate of water movement through the

soils, is moderately slow to moderately rapid in the organic layers and moderately slow or moderate in the mineral substratum. In the Greenwood soils it is rapid or very rapid in the uppermost 14 inches and moderate or moderately rapid below. Surface runoff is very slow or ponded. The capacity to store water available for plants is very high. The surface layer is moderately acid to mildly alkaline in the Cathro soils and extremely acid in the Greenwood soils.

Most areas of these soils are forested or covered with water-tolerant bushes and weeds.

These soils are not suited to recreation and urban uses because of ponding, the seasonal high water table, large amounts of organic material, and low strength. These soils are suited to use as habitat for wetland wildlife.

Potential productivity for trees on these soils is low. Red spruce, white cedar, and red maple are common on these soils. Seedling mortality is high. The seasonal high water table limits the use of equipment and restricts rooting depth; consequently, trees can be uprooted in windy periods.

These soils are not suited to cultivated crops because of the seasonal high water table. These soils are at high elevations and have a shorter growing season than areas at lower elevations.

These soils are in capability subclass Vw.

ChB—Charlton fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, well drained soil on smooth hilltops and hillsides on uplands. Areas of the soil are oval to rectangular and range from 5 to 50 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 7 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam about 21 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton and Massena soils in nearly level areas, on concave foot slopes, along drainageways, and in depressions. Also included are a few areas of Paxton soils that have a firm, dense substratum and Woodstock soils that are shallow to bedrock. Also included, at an elevation above 1,000 feet, are areas of Bice soils. Also included are scattered areas of rock outcrop and areas where stones and boulders are on the surface. Areas of included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Charlton soil is at a depth of 6 feet or more. Bedrock is generally at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is slow or medium. The capacity of the soil to store water available for plants is moderate. Small rock fragments make up 5 to 15 percent of the surface layer. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil that had been cleared for farming have reverted to forest or brush. Some areas are used for recreation, and a few areas are used for crops.

This soil is suited to many recreation and urban uses. Most areas have suitable sites for picnic areas, campgrounds, paths and trails, dwellings, and septic tank absorption fields. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to the water table and the permeability of the soil.

Potential productivity for trees on this soil is moderate. Northern red oak and eastern white pine are common in wooded areas. White pine is commonly planted in reforestation. Planting when the soil is moist in early spring and removing brush help to improve the rate of seedling survival.

This soil is well suited to most cultivated crops grown in the region. Erosion is a hazard in areas where slope is long and in areas unprotected by plant cover. Contour farming, cover crops or sod crops, and conservation tillage systems that return crop residue to the soil help to control erosion, to increase organic matter content, and to improve soil tilth. In some areas, stones and boulders on the surface and occasional rock outcrops limit the use of machinery. Crops respond well to lime and fertilizer. In some years this soil is droughty.

This soil is in capability subclass IIe.

ChC—Charlton fine sandy loam, 8 to 15 percent slopes. This is a sloping, deep, well drained soil on smooth, convex ridges, on hillcrests, and on hillsides on uplands. Areas of this soil are oval to rectangular and range from 5 to 75 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 7 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam about 21 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton and Massena soils on foot slopes and along drainageways. Also included are a few areas of Paxton soils, which have a firm, dense substratum, and Woodstock soils, which are shallow to bedrock. Also included, at elevations above 1,000 feet, are areas of Bice soils. Also included are scattered areas of rock outcrop and areas where stones or boulders are on the surface. Areas of included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Charlton soil is at a depth of 6 feet or more. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is medium. The capacity of the soil to store water available for plants is moderate. Small rock fragments make up 5 to 15 percent of the surface

layer. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil that had been cleared for farming have reverted to forest or are idle brushland. Some areas are used for recreation, and a few areas are used for crops.

This soil is suited to some recreation and urban uses. Many areas have suitable sites for picnic areas, campgrounds, paths and trails, and dwellings. The main limitation is slope. Ponds are difficult to develop because of slope, the depth to the water table, and the permeability of the soil.

Potential productivity for trees on this soil is moderate. Northern red oak and eastern white pine are common in wooded areas. White pine is commonly planted in reforestation. This soil can be droughty; thus planting when the soil is moist in early spring and removing brush help to improve the rate of seedling survival.

This soil is suited to some cultivated crops grown in the region. Erosion is a serious hazard on long slopes and in areas unprotected by plant cover. Contour farming, cover crops or sod crops, and conservation tillage systems that return crop residue to the soil help to control erosion, to increase organic matter content, to improve soil tilth, and to improve the water-holding capacity of the soil. In some areas, stones and boulders on the surface and scattered rock outcrops limit the use of machinery. Crops respond well to lime and fertilizer, although in some years the soil is droughty.

This soil is in capability subclass IIIe.

ChD—Charlton fine sandy loam, 15 to 25 percent slopes. This is a moderately steep, deep, well drained soil on hillsides and sides of ridges on uplands and valley sides. Areas of this soil are oval to rectangular and range from 3 to 30 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 7 inches thick. The subsoil is dark yellowish brown, yellowish brown, and light olive brown fine sandy loam about 21 inches thick. The substratum is grayish brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton and Massena soils on foot slopes and along drainageways. Also included are a few areas of Paxton soils, which have a firm, dense substratum, and Woodstock soils, which are shallow to bedrock. Also included, at an elevation above 1,000 feet, are areas of Bice soils. Also included are scattered areas of rock outcrop and, commonly at the foot of slopes, areas where stones or boulders are on the surface. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Charlton soil is at a depth of 6 feet or more. Bedrock is at a depth of 60 inches or more. Permeability, at the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is rapid. The capacity of the soil to store water available for plants is moderate. Small rock fragments make up 5 to 15 percent of the surface layer. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil that had been cleared for farming have reverted to forest or are idle. Some areas are used for recreation, and a few areas are used for pasture or hay.

The main limitation of this soil for recreation and urban uses is slope. Some areas have suitable sites for paths and hiking trails, ski slopes, and, if improved with appropriate shrub plantings, habitat for woodland wildlife.

Potential productivity for trees on this soil is moderate. Slope limits the use of planting and harvesting equipment. Northern red oak and eastern white pine are common on the soil. White pine is commonly planted in reforestation. The soil tends to be droughty in dry years; thus planting when the soil is moist in early spring and removing brush help to improve the rate of seedling survival.

This soil is moderately suited to some cultivated crops grown in the region. Slope somewhat limits the use of equipment. Erosion is a very serious hazard on long slopes and in areas unprotected by plant cover. The soil is best suited to permanent sod crops, which help to control erosion. In some areas stones and boulders on the surface and scattered rock outcrops also limit the use of equipment. In some years the soil is droughty.

This soil is in capability subclass IVe.

Du—Dumps, mine. This map unit consists of piles of tailings mainly from garnet mining operations. These spoil piles are nearly level to steep and are irregular in shape. Mine dumps are 2 to 10 acres in size.

These mine dumps are generally devoid of vegetation, although some of the older ones have scattered trees, brush, and grass growing on them. They are droughty because of the very low capacity of the material to hold water. The rate of water movement through the mine spoil is moderately rapid to very rapid.

These areas are suited to poorly suited to urban and recreation uses. Onsite investigation is needed on each individual site.

Areas of mine dumps are poorly suited to farming and to use as woodland and habitat for wildlife.

Many of the areas in this map unit are a probable source of material for road subgrades.

ElB—Elmridge fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, moderately well drained soil that formed in a thin mantle of loamy deposits over clayey sediment. It is on smooth, sloping or undulating lowland plains. Areas are rectangular or fan-shaped and range from 5 to 20 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is yellowish

brown fine sandy loam to a depth of about 23 inches. In the lower part it is mottled. The substratum is grayish brown silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hartland, Oakville, Agawam, Elnora, and Belgrade soils. Also included are Shaker and Raynham soils along drainageways and in low spots. Also included are areas of soils where the clayey substratum overlies loamy or sandy deposits at a depth of less than 60 inches. Included areas are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Elmridge soil is at a depth of 1 1/2 to 3 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and the subsoil and slow or very slow in the clayey substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is high. In unlimed areas the surface layer is very strongly acid to slightly acid.

Most areas of this soil are forested. A few areas are used for farming.

This soil is moderately suited to recreation uses. The seasonal high water table in spring is a limitation for campsites and playgrounds. Ponds and habitat for wetland wildlife are difficult to develop because of the variable depth to ground water in midsummer. The main limitations to urban use are the permeability in the substratum, the seasonal high water table, and moderate potential frost action.

Potential productivity for trees on this soil is moderately high. White pine is commonly planted in reforestation. Planting when the soil is moist in early spring and removing brush help to improve the rate of seedling survival. Red oak and yellow birch are common on this soil.

This soil is well suited to most cultivated crops grown in the region. In some years the seasonal high water table in spring and fall interferes with planting and harvesting. Contour farming, cover crops and sod crops, and conservation tillage systems that return crop residue to the soil help to control erosion, to increase organic matter content, and to improve soil tilth. Subsurface drainage to eliminate wet spots is needed in many fields. On pasture, restricted grazing in spring and during other wet periods helps to prevent surface compaction.

This soil is in capability subclass IIw.

En—Elnora loamy fine sand. This is a nearly level, deep, moderately well drained soil that formed in sandy deposits on terraces, benches, and lowland plains. Slope ranges from 0 to 3 percent. Areas are oval to rectangular and range from 3 to 30 acres.

Typically, the surface layer is very dark grayish brown loamy fine sand about 10 inches thick. The subsoil is mottled, yellowish brown loamy fine sand and fine sand about 18 inches thick. The substratum is grayish brown fine sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Wareham soils in depressions and along drainageways. Also included are Oakville soils on knolls or in gently sloping areas. Included areas are 1 to 3 acres and make up 10 percent of the map unit.

The seasonal high water table in this Elnora soil is at a depth of 1 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and rapid in the subsoil and the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is low. Rock fragments are generally not in the soil, but in some layers make up as much as 2 percent, by volume. In unlimed areas the surface layer is extremely acid to slightly acid.

Most areas of this soil are idle or forested.

This soil is moderately suited to most types of urban and recreation uses. The main limitations to these uses are the seasonal high water table and stability of cutbanks. In some years this soil is droughty in midsummer; thus lawns and sod cover for playgrounds are commonly difficult to establish and maintain unless irrigated. Ponds are generally difficult to establish because embankments in the soil tend to slough, and in some areas seepage is a problem in midsummer when the water table is low.

Potential productivity for trees on this soil is moderate. White pine, birch, sugar maple, and red oak are common on this soil. This soil is droughty; thus planting seedlings early in spring is essential for a high rate of seedling survival.

This soil is only moderately suited to cultivated crops. Most areas of this soil are small in size, low in natural fertility, and droughty in midsummer and have a seasonal high water table in spring and during other wet periods of the year. Drainage of the included wet spots will make the management of many fields more uniform. Management practices that increase the organic matter content, such as use of cover crops and returning crop residue to the soil, help to improve the water-holding capacity of the soil.

This soil is in capability subclass IIIw.

FaB—Farmington loam, 0 to 8 percent slopes. This is a nearly level to gently sloping, shallow, well drained or somewhat excessively drained soil on smooth or stepped areas where the landscape is influenced by the underlying limestone bedrock. Most areas are oval to rectangular and range from 5 to 50 acres.

Typically, the surface layer is dark brown loam about 8 inches thick. The subsoil is yellowish brown loam about 5 inches thick. Gray limestone bedrock is at a depth of 13 inches.

Included with this soil in mapping are areas of the moderately deep Galway soil and soils less than 10 inches deep to bedrock. Also included are scattered areas of rock outcrop and a few small limestone quarries. Also included, in some areas, are sandy Oakville and Elnora soils. Also included are wet soils in small depressions or seep areas. Included areas are 1/4 to 3 acres in size and make up 15 percent of the map unit.

The seasonal high water table in this Farmington soil generally does not occur above bedrock, which is at a depth of 10 to 20 inches. Permeability, or the rate of water movement through the soil, is moderate. The capacity of the soil to store water available to plants is low or very low. Rock fragments make up 5 to 15 percent of the surface layer. In unlimed areas the surface layer is slightly acid to strongly acid.

Some areas of this soil are used for farming, and a few other areas are used for community development and recreation. Many areas have reverted to brush or are forested.

This soil is poorly suited to most recreation and urban uses because of the shallow depth to hard bedrock and droughtiness. Some areas are suitable for development of paths and trails and other recreation uses that do not require subsurface excavation.

Potential productivity for trees on this soil is low. Windthrow is a moderate hazard because of the shallow rooting depth, and the rate of seedling survival is low because of droughtiness. Sugar maple, red oak, and white ash are common on the soil.

This soil is poorly suited to cultivated crops because of the shallow depth to bedrock and droughtiness. Pasture or hay crops help to conserve moisture and to control erosion in areas where slopes are long. In places surface stones limit the use of farm equipment.

This soil is in capability subclass IIIs.

FrC—Farmington loam, very rocky, 3 to 15 percent slopes. This is a gently sloping or sloping, shallow, well drained or somewhat excessively drained soil on landscapes influenced by the underlying limestone bedrock. Rock outcrops range from smooth, nearly level areas to short, vertical ledges, and are about 30 to 100 feet apart. Most areas are oval to rectangular and range from 5 to 100 acres.

Typically, the surface layer of the Farmington soil is dark brown loam about 8 inches thick. The subsoil is yellowish brown loam about 5 inches thick. Gray limestone bedrock is at a depth of 13 inches.

Included with this soil in mapping are areas of moderately deep Galway soil and soils less than 10 inches deep to bedrock. Also included, in some areas, are sandy Oakville and Elnora soils. Also included are wet soils in small depressions or seep areas. Also included are small areas that are nearly level or steep. Areas of included soils are 1/4 to 3 acres, and make up 15 percent of the map unit.

The seasonal high water table in this Farmington soil generally does not occur above bedrock, which is at a depth of 10 to 20 inches. Permeability, or the rate of water movement through the soil, is moderate. The capacity to store water available to plants is low or very low. Rock fragments make up 5 to 15 percent of the surface layer. Rock outcrops cover 2 to 10 percent of the surface. In unlimed areas the surface layer is slightly acid to strongly acid.

Most areas of this soil are forested or covered with shrubs and small trees. Very few areas are used for farming.

This soil is poorly suited to most recreation uses, including picnic grounds and campgrounds, because of the shallow depth to bedrock, droughtiness, and the numerous rock outcrops. Depth to bedrock and rock outcrops are also very serious limitations to urban uses. Some areas are suitable for paths and trails and other recreation uses that do not require subsurface excavation.

Potential productivity for trees on this soil is low. Windthrow is a moderate hazard because of the shallow rooting depth. The rate of seedling survival is low because of droughtiness. Rock outcrops limit the use of equipment for planting seedlings and for some harvesting practices. Sugar maple, red oak, and white ash are common on this soil.

This soil is not suited to cultivated crops because of rock outcrops, shallow depth to bedrock, and droughtiness. Some areas are suited to pasture in spring and early summer when moisture is adequate for plant growth.

This soil is in capability subclass VIs.

Fu—Fluvaquents-Udifluvents complex, frequently flooded. This map unit consists of nearly level to gently sloping soils in areas along streams. It is about 45 percent Fluvaquents, 30 percent Udifluvents, and 25 percent other soils. These soils are subject to frequent flooding, which results in stream scouring, lateral erosion, and shifting of soil deposits from one place to another. The areas of somewhat poorly drained to very poorly drained Fluvaquents and well drained or moderately well drained Udifluvents are so intermingled that it was not practical to map them separately at the scale selected for mapping. Udifluvents are in slightly higher areas on the landscape. Slope ranges from 0 to 5 percent, but is mainly less than 3 percent. Areas are mostly long and narrow and adjacent to secondary streams. A few areas are wider and along larger streams and rivers. Areas are commonly 5 to 20 acres.

The soils in this map unit have little or no profile development. Soil characteristics, including texture, rock fragment content, and drainage, differ within short

distances; consequently, mapping individual soils was not practical.

Fluvaquents differ from place to place. Generally, the surface layer is dark brown or dark gray very gravelly fine sand to silty clay loam 1 to 6 inches thick. The substratum extends to a depth of 60 inches or more. It is mottled, gray or dark brown sand to silty clay loam. In places it has gravel and stones.

Udifluvents differ from place to place. Generally, the surface layer is brownish or grayish fine sandy loam to silt loam 1 to 5 inches thick. The substratum extends to a depth of 60 inches or more. It is brown to reddish brown fine sand to silt loam. In places it has gravel and stones.

Included with this soil in mapping are a few small areas of Tioga and Middlebury soils. Also included are areas of Cathro and Greenwood mucks along the Schroon River and its tributaries. Also included, along the Hudson River, are areas of Tioga soils that flood frequently. Also included are very gravelly soils on islands in the Hudson River from the village of The Glen to the county line. Also included are small areas, near major streams, of soils that have a surface layer of recently deposited sand or gravel. The included areas are 1/4 to 3 acres and make up about 25 percent of the map unit.

Most areas of this map unit are idle and support native grasses, brush, and a few trees, such as willow, alder, silver maple, and hemlock.

This soil is poorly suited to urban use, recreation use, woodland use, and farming. It is not suited to cultivated crops. Some areas are suited to pasture. Reseeding, applying lime and fertilizer, and other management practices are difficult because areas of these soils are generally inaccessible, have variable topography, or are dissected by old stream channels. Soil features important to use and management, such as available water capacity, texture, small stone content, surface topography, permeability, depth to the seasonal high water table, and soil reaction differ greatly within short distances. The main limitations to most uses of the soils are the hazard of frequent flooding and the variability of soil characteristics. Some areas are suited to use as sites for ponds or as wildlife marshes. Onsite investigation is needed for any intended use.

This soil is in capability subclass Vw.

GaB—Galway loam, 3 to 8 percent slopes. This is a gently sloping, moderately deep, well drained and moderately well drained soil on landscapes where the topography is influenced by the underlying limestone bedrock. The surface is generally smooth, but some areas are steep and uneven. Areas of the soil are oval to rectangular and range from 5 to 50 acres.

Typically, the surface layer is very dark grayish brown loam about 9 inches thick. The subsoil is yellowish brown and brown loam about 19 inches thick. The substratum is grayish brown loam about 2 inches thick. Gray limestone bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of Farmington soils, which have bedrock within 20 inches of the surface, and areas of soils that are deeper than 40 inches to bedrock. Also included, in a few spots, are areas of sandy Oakville and Elnora soils. Also included are small areas of wet soils in depressions or around seep spots, scattered areas of rock outcrops, and areas where stones are on the surface. The included areas are 1/2 to 3 acres and make up less than 15 percent of the map unit.

The seasonal high water table in this Galway soil is at a depth of 1 1/2 to 3 feet. Bedrock is at a depth of 20 to 40 inches. Permeability, or the rate of water movement through the soil, is moderate. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is low or moderate. Rock fragments make up 3 to 15 percent of the surface layer. The surface layer is moderately acid to neutral.

Most areas of this soil had been cleared for farming. Some areas are now idle, forested, and in urban and recreation uses.

This soil is suited to many recreation uses. Most areas provide good sites for picnic areas, campgrounds, and paths and trails. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to bedrock and the variable depth to the water table.

Depth to bedrock is a serious limitation for many urban uses that require subsurface excavation. Onsite investigation is needed to determine suitable areas of the included deep soils for use as building sites.

Potential productivity for trees on this soil is moderately high. There are few problems in woodland management. White pine and Norway spruce are commonly planted in reforestation. Sugar maple, red oak, beech, and white pine are common on this soil.

This soil is well suited to most cultivated crops grown in the region. Scattered, included areas of rock outcrops and shallow spots interfere with tillage operations in some areas where row crops are grown. Crops respond well to fertilizer. Erosion is a hazard in areas where slopes are long and in areas unprotected by plant cover. Crop rotation, cover crops, and crop residue mixed into the soil help to improve soil tilth and to control erosion.

This soil is in capability subclass IIe.

HaB—Hartland very fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, well drained soil on terraces or benches in valleys and on undulating plains. Most areas are rectangular or long and oval and range from 5 to 20 acres.

Typically, the surface layer is dark brown very fine sandy loam about 8 inches thick. The subsoil is yellowish brown and brownish yellow very fine sandy loam about 13 inches thick. The substratum is brownish yellow and

light olive brown very fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are Belgrade and Raynham soils in level areas, in depressions, and along drainageways. Also included are some areas of sandy Oakville and Plainfield soils. Also included are small areas of Elmridge, Shaker, and Rhinebeck soils. In some places the surface layer is gravelly very fine sandy loam. Areas of included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Hartland soil is at a depth of more than 6 feet. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and the subsoil and moderately slow or moderate in the substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is high. In unlimed areas the surface layer is strongly acid to neutral.

Many areas of this soil are used for farming or recreation. Some areas are used for community development, and a few areas are idle and covered with brush and small trees.

This soil is suited to many recreation and urban uses. Most areas have suitable sites for picnic areas, campgrounds, paths and trails, and dwellings. Potential frost action is a limitation for roads and streets, and the permeability in the substratum is a limitation for septic tank absorption fields. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to the water table.

Potential productivity for trees on this soil is moderately high. White pine, sugar maple, and red oak are common on this soil. In reforestation, there are few limitations to managing this soil. The rate of seedling survival is high because of the water-holding capacity of the soil.

This soil is well suited to most cultivated crops grown in the region. Many crop varieties are restricted because of the short growing season in the northern part of the county. Erosion is a serious hazard in areas unprotected by plant cover or in areas where slope is long. Cover crops and conservation tillage systems that return plant residue to the surface help to control erosion, to increase organic matter content, and to improve soil tilth. Crops respond well to lime and fertilizer if moisture is adequate.

This soil is in capability subclass IIe.

HaC—Hartland very fine sandy loam, 8 to 15 percent slopes. This is a sloping, deep, well drained soil on benches in valleys and in rolling areas on lowland plains. Most areas are rectangular or long and oval and range from 3 to 10 acres.

Typically, the surface layer is dark brown very fine sandy loam about 8 inches thick. The subsoil is yellowish brown and brownish yellow very fine sandy loam about 13 inches thick. The substratum is brownish yellow and light olive brown very fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are Belgrade and Raynham soils in depressions and along drainageways. Also included are some areas of the sandy Oakville and Plainfield soils. Also included are small areas of Elmridge, Shaker, and Rhinebeck soils. In some units the surface layer is gravelly very fine sandy loam. Areas of included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Hartland soil is at a depth of more than 6 feet. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and the subsoil and moderate or moderately slow in the substratum. Surface runoff is medium. The capacity of the soil to store water available for plant growth is high. In unlimed areas the surface layer is strongly acid to neutral.

Many areas of this soil are used for farming or recreation. A few areas are in urban use. Some areas are forested or are idle and covered with brush and small trees.

This soil is suited to some recreation and urban uses. The main limitation to many uses, such as campgrounds, picnic areas, playgrounds, and dwellings, is slope. The permeability in the substratum is also a limitation to some uses, such as septic tank absorption fields. Ponds and habitat for wetland wildlife are difficult to develop because of slope and the depth to the water table.

Potential productivity for trees on this soil is moderately high. Erosion is a moderate hazard on logging roads and skid trails. Laying out roads and trails across the slope helps to prevent gullying. White pine, sugar maple, and red oak are common on this soil. The rate of seedling survival generally is high because of the water-holding capacity of the soil.

This soil is suited to most crops grown in the region. The main limitation is slope. Erosion is a hazard. The soil is suited to hay and pasture, and these uses help to control erosion. If row crops are grown, contour farming, stripcropping, and conservation tillage systems that return crop residue to the soil help to control erosion. Crops respond well to lime and fertilizer if moisture is adequate.

This soil is in capability subclass IIIe.

HeC—Hermon very bouldery fine sandy loam, sloping. This is a deep, well drained and somewhat excessively drained soil on hilltops, hillsides, and mountain sides. Boulders and stones 5 to 30 feet apart are on the surface. Slope ranges from 3 to 15 percent. Most areas are oval to rectangular and range from 40 to 200 acres.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 5 inches thick. The

subsoil is about 20 inches thick. In the upper 7 inches it is dark reddish brown gravelly fine sandy loam, in the middle 6 inches it is dark brown gravelly fine sandy loam, and in the lower 7 inches it is yellowish brown very gravelly sandy loam. The substratum is grayish brown very gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Marlow and Peru soils, which have a firm, dense substratum, and Bice and Schroon soils, which are not as gravelly as this Hermon soil. Also included are areas of soils that are 20 to 40 inches deep to bedrock. Also included, in places, are small areas of rock outcrops. The included areas are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in ths Hermon soil is at a depth of more than 6 feet. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is rapid. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is low or moderate. Boulders are in most areas of the soil. In unlimed areas the surface layer is extremely acid to strongly acid.

Most areas of this soil are forested (fig. 4). Some areas that had been cleared for farming are idle or in pasture.

This soil is moderately suited to some recreation uses. The gently sloping areas are suited to camp and picnic areas, and most areas are suited to hiking paths and trails. The main limitations of the soil for urban use are slope, boulders and stones on the surface, and droughtiness in midsummer. Ground water contamination is a hazard if the soil is used for sanitary waste disposal systems because the soil is a poor filter of effluent.

Figure 4.—Typical landscape of Hermon very bouldery fine sandy loam, sloping. Most areas are woodland, and some areas are in such recreation uses as ski slopes. (Photo courtesy of Richard K. Dean)

Potential productivity for trees on this soil is moderate. The rate of seedling survival is low because of droughtiness during some parts of the year. Boulders and stones on the surface restrict the use of equipment for some timber harvesting operations and for planting seedlings. White pine, white spruce, and beech are common in wooded areas.

This soil is not suited to cultivated crops and hay. The main limitations are boulders and stones on the surface and the short growing season because of the high elevation of the soil.

This soil is in capability subclass VIs.

HeE—Hermon very bouldery fine sandy loam, steep. This is a deep, well drained and somewhat excessively drained soil on ridges and mountain sides. Boulders and stones 5 to 30 feet apart are on the surface. Slope ranges from 15 to 45 percent. Most areas are oval to rectangular and range from 40 to 200 acres.

Typically, the surface layer is very dark grayish brown gravelly fine sandy loam about 5 inches thick. The subsoil is about 20 inches thick. In the upper 7 inches it is dark reddish brown gravelly fine sandy loam, in the middle 6 inches it is dark brown gravelly fine sandy loam, and in the lower 7 inches it is yellowish brown very gravelly sandy loam. The substratum is grayish brown very gravelly loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Marlow and Peru soils, which have a firm, dense substratum. Also included, in a few spots, are Bice soils, which are not as gravelly as this Hermon soil. Also included are areas of soils that are 20 to 40 inches deep to bedrock. Also included, in places, are small areas of rock outcrops. The included areas are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Hermon soil is at a depth of more than 6 feet. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is rapid. Surface runoff is medium or rapid. The capacity of the soil to store water available for plant growth is low or moderate. Boulders are on the surface in most areas of the soil. In unlimed areas the surface layer is extremely acid to strongly acid.

Most areas of this soil are forested.

The main limitations of the soil for recreation and urban uses are slope and numerous boulders and stones on the surface.

Potential productivity for trees on this soil is moderate. The rate of seedling survival is low because of dry soil conditions during some parts of the year. Stones and boulders on the surface and slope restrict the use of equipment for harvesting timber and planting seedlings. White pine, white spruce, and beech are common on this soil.

This soil is not suited to most cultivated crops. The main limitations are the short growing season because of the high elevations of the soil, slope, and numerous boulders and stones on the surface.

This soil is in capability subclass VIIs.

HmC—Hermon-Lyman-Rock outcrop complex, sloping. This map unit consists of deep, well drained and somewhat excessively drained Hermon soils, shallow, somewhat excessively drained Lyman soils, and areas of Rock outcrop. It is about 45 percent Hermon soils, 20 percent Lyman soils, 15 percent Rock outcrop, and 20 percent other soils. It is on mountain sides and hilltops in areas where the landscape is influenced by underlying bedrock. Areas of these soils are mostly oval or round and 40 to 250 acres. Boulders and stones 5 to 30 feet apart are on the surface. These soils are in such an intricate pattern on the landscape that they could not be separated at the scale selected for mapping. Slope ranges from 3 to 15 percent, but is dominantly 8 to 15 percent.

Typically, the surface layer of Hermon soil is very dark grayish brown gravelly fine sandy loam about 5 inches thick. The subsoil is about 20 inches thick. In the upper 7 inches it is dark reddish brown gravelly fine sandy loam, in the middle 6 inches it is dark brown gravelly fine sandy loam, and in the lower 7 inches it is yellowish brown very gravelly sandy loam. The substratum is grayish brown very gravelly loamy sand to a depth of 60 inches or more.

Typically, the Lyman soil is covered with a partly decomposed leaf mat. The surface layer is very dark gray fine sandy loam about 2 inches thick. The subsoil is dark reddish brown, reddish brown, and strong brown fine sandy loam about 15 inches thick. Granite bedrock is at a depth of about 17 inches.

Included with this unit in mapping are areas of deep Marlow and Peru soils, which have a firm, dense substratum. Also included are areas of soils that are 20 to 40 inches deep to bedrock and soils that are less than 10 inches deep to bedrock. Also included is stone rubble accumulated at the base of steep slopes. The included areas are as much as 10 acres.

A seasonal high water table does not occur in the Hermon and Lyman soils or is at a depth of more than 6 feet. Bedrock is mainly at a depth of 60 inches or more in the Hermon soil and at a depth of 8 to 20 inches in the Lyman soil. Permeability, or the rate of water movement through the soil, is rapid in the Hermon soil and moderately rapid in the Lyman soil. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is low or moderate in the Hermon soil and low or very low in the Lyman soil. The surface layer is extremely acid to strongly acid in the Hermon soil and extremely acid to moderately acid in the Lyman soil.

Most areas of the soils in this map unit are forested. Some areas, where areas of rock outcrops are numerous, are bare of plant cover.

These soils are moderately suited to some recreation uses. The gently sloping areas of the Hermon soils are suited to camp and picnic areas. Most areas of this map unit are suited to hiking paths and trails. The main limitations to other recreation uses and to urban use are slope, depth to bedrock in the Lyman soil, the numerous boulders and stones on the surface, and rock outcrops. Ground water contamination is a hazard if the soils are used as sites for sanitary waste disposal systems because the soils are a poor filter of effluent.

Potential productivity for trees on these soils is moderate. The rate of seedling survival is low because of droughtiness in most years. On the Lyman soil, windthrow is a hazard because of shallow depth to bedrock. The boulders and stones on the surface and rock outcrops limit the use of equipment for harvesting timber and planting seedlings. Sugar maple, white spruce, and red spruce are common on these soils.

These soils are not suited to cultivated crops or hay. The main limitations are the boulders and stones on the surface, shallowness on the Lyman soil, rock outcrops, and the short growing season because of the high elevation of these soils.

These soils are in capability subclass VIIs.

HmE—Hermon-Lyman-Rock outcrop complex, steep. This map unit consists of deep, well drained and somewhat excessively drained Hermon soil, shallow, somewhat excessively drained Lyman soil, and areas of Rock outcrop. It is about 40 percent Hermon soil, 20 percent Lyman soil, 20 percent Rock outcrop, and 20 percent other soils. These soils are on mountain sides and ridges in areas where the topography is influenced by the underlying bedrock. Areas are mostly oval or rectangular and 40 to 250 acres. Boulders and stones 5 to 30 feet apart are on the surface. These soils are in such an intricate pattern on the landscape that they could not be separated at the scale selected for mapping. Slope ranges from 15 to 45 percent, but is dominantly 15 to 35 percent.

Typically, the surface layer of the Hermon soil is very dark grayish brown gravelly fine sandy loam about 5 inches thick. The subsoil is about 20 inches thick. In the upper 7 inches it is dark reddish brown gravelly fine sandy loam, in the middle 6 inches it is dark brown gravelly fine sandy loam, and in the lower 7 inches it is yellowish brown very gravelly sandy loam. The substratum is grayish brown very gravelly loamy sand to a depth of 60 inches or more.

Typically, the surface layer of the Lyman soil is covered with a partly decomposed leaf litter. The surface layer is very dark gray fine sandy loam about 2 inches thick. The subsoil is dark reddish brown, reddish brown, and strong brown fine sandy loam about 15 inches thick. Granite bedrock is at a depth of about 17 inches.

Included with this unit in mapping are areas of the deep Marlow and Peru soils, which have a firm, dense substratum. Also included are areas of soils that are 20 to 40 inches deep to bedrock and soils that are less than 10 inches deep to bedrock. Also included, in some places, are areas of stone rubble accumulated at the base of steep slopes. The included areas are as much as 10 acres.

A seasonal high water table does not occur in the Hermon and Lyman soils, or it is at a depth of more than 6 feet. Bedrock is mainly at a depth of 60 inches or more in the Hermon soil and at a depth of 8 to 20 inches in the Lyman soil. Permeability, or the rate of water movement through the soil, is rapid in the Hermon soil and moderately rapid in the Lyman soil. Surface runoff is medium or rapid. The capacity of the soil to store water available for plant growth is low to moderate in the Hermon soil and low or very low in the Lyman soil. The surface layer is extremely acid to strongly acid in the Hermon soil and extremely acid to moderately acid in the Lyman soil.

Most areas of the soils in this map unit are forested. Some areas where rock outcrops are dominant are unprotected by plant cover.

The main limitations of these soils for most recreation and urban uses are slope, shallow depth to bedrock on the Lyman soil, rock outcrops, and the numerous stones and boulders on the surface. Some less steep areas are suitable for hiking paths and trails.

Potential productivity for trees on this soil is moderate. In most years the rate of seedling survival is low because of droughtiness. On the Lyman soil, windthrow is a hazard. Slope, boulders and stones on the surface, and nearly vertical rock outcrops seriously limit the use of equipment for harvesting timber and planting seedlings. Sugar maple, white spruce, and red spruce are common on these soils.

These soils are not suited to cultivated crops. The main limitations are slope, boulders on the surface, rock outcrops, and the short growing season because of the high elevation of these soils.

These soils are in capability subclass VIIIs.

HnA—Hinckley cobbly sandy loam, 0 to 3 percent slopes. This is a nearly level, deep, excessively drained soil on terraces and benches in valleys and on nearly flat plains. The soil has a high content of sand, gravel, and cobblestones. Most areas are long and narrow or oval, and range from 5 to 30 acres.

Typically, the surface layer is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark gray cobbly sandy loam about 4 inches thick. The subsoil is dark brown very gravelly loamy sand and dark yellowish brown gravelly sand about 23 inches thick. The substratum is olive brown, stratified, very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Castile and Wareham soils on foot slopes and along drainageways. Also included are small areas of very

poorly drained soils and Palms muck in depressions. Also included, adjacent to streams, are areas of soils that are subject to flooding. Also included are small areas of soils in the northern part of the survey area that have a red subsoil and a few areas of soils that do not have cobblestones in the surface layer. Also included, in some areas, are sand and gravel pits and small areas of rock outcrops. The included areas are 1/4 to 3 acres and make up about 20 percent of the map unit.

The seasonal high water table in this Hinckley soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is rapid in the surface layer and the subsoil and very rapid in the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is very low or low. Cobblestones and gravel make up 15 to 35 percent of the surface layer and 10 to 60 percent of the subsoil. In unlimed areas the surface layer is extremely acid to moderately acid.

A few areas of this soil are used for cultivated crops and hay. Some areas are in urban and recreation uses. Many areas that had been cleared have reverted to brush and forest.

This soil is suited to some recreation uses and to most urban uses. Many areas have sites for picnic areas, campgrounds, paths and trails, and dwellings. Cobblestones on the surface are a limitation to many of these uses. If this soil is used for sanitary waste disposal systems, ground water contamination is a hazard because of poor filtering of effluent. Droughtiness and cobblestones on the surface limit the establishment of lawns and sod cover for playgrounds. The soil is a probable source of sand and sod cover for playgrounds.

Potential productivity for trees on this soil is low. Seedling mortality is a problem because of droughtiness. Cutting brush and weeds before planting, planting when the soil is moist, and selecting suitable varieties help to increase the rate of seedling survival. In some areas cobblestones on the surface limit the use of equipment for planting seedlings. Red oak and white pine are common on the soil.

This soil is suited to some cultivated crops grown in the region, but the crop varieties are restricted because of the relatively short growing season and droughtiness. Irrigation is more practical on nearly level slopes than in the steeper areas. Cobblestones and gravel hinder some tillage operations and cause rapid wear of equipment. Natural fertility is generally low, but crops respond well to lime and fertilizer if soil moisture is adequate. Cover crops, sod crops in the cropping system, and crop residue returned to the soil increase organic matter content, improve soil tilth, and increase the water-holding capacity of the soil.

This soil is in capability subclass IIIs.

HnB—Hinckley cobbly sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, excessively drained soil on terraces and benches in valleys and on undulating plains. The soil has a high content of sand, gravel, and cobblestones. Most areas are long and narrow, or oval, and range from 5 to 40 acres.

Typically, the surface layer is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark gray cobbly sandy loam about 4 inches thick. The subsoil is dark brown very gravelly loamy sand and dark yellowish brown gravelly sand about 23 inches thick. The substratum is olive brown, stratified, very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Castile and Wareham soils on foot slopes and along drainageways. Also included are small areas of very poorly drained soils and Palms muck in deep depressions. Also included, adjacent to streams, are small areas of soils that are subject to flooding. Also included are small areas of soils in the northern part of the survey area that have a reddish subsoil and a few areas of soils that do not have cobblestones in the surface layer. Included in some units are sand and gravel pits and small areas of rock outcrops. Included areas are 1/4 to 3 acres and make up about 20 percent of the map unit.

The seasonal high water table in the Hinckley soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is rapid in the surface layer and the subsoil and very rapid in the substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is very low or low. Cobblestones and gravel make up 15 to 35 percent of the surface layer and 10 to 60 percent of the subsoil. In unlimed areas the surface layer is extremely acid to moderately acid.

A few areas of this soil are used for cultivated crops and hay. Some areas are used for community development and recreation. Many areas that had been cleared have reverted to brush and forest.

This soil is suited to some recreation uses and to most types of urban uses. Many areas have sites for picnic areas, campgrounds, paths and trails, and dwellings. Cobblestones on the surface are a limitation to many of these uses. If the soil is used for sanitary waste disposal systems, ground water contamination is a hazard because of poor filtering of effluent. Droughtiness and cobblestones on the surface limit the establishment of lawns and sod cover for playgrounds. The soil is a probable source of sand and gravel.

Potential productivity for trees on this soil is low. Seedling mortality is a problem because of droughtiness. Cutting brush and weeds before planting, planting when the soil is moist, and selecting suitable drought-tolerant varieties help to increase the low rate of seedling survival. In some areas cobblestones on the surface limit

the use of equipment for planting seedlings. Red oak and white pine are common on the soil.

This soil is suited to some cultivated crops grown in the region, but the crop varieties are restricted because of the relatively short growing season and droughtiness. Slope limits the use of some irrigation systems. Cobblestones and gravel hinder some tillage operations and cause rapid wear of equipment. Natural fertility is generally low, but crops respond well to lime and fertilizer if soil moisture is adequate. Cover crops, sod crops in the cropping system, and crop residue returned to the soil help to control erosion, to increase organic matter content, to improve soil tilth, and to increase the water-holding capacity of the soil.

This soil is in capability subclass IIIs.

HnC—Hinckley cobbly sandy loam, 8 to 15 percent slopes. This is a sloping, deep, excessively drained soil on terraces and benches in valleys and on rolling plains. The soil has a high content of sand, gravel, and cobblestones. Most areas are oval or irregular in shape, and range from 5 to 40 acres.

Typically, the surface layer is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark gray cobbly sandy loam about 4 inches thick. The subsoil is dark brown very gravelly loamy sand and dark yellowish brown gravelly sand about 23 inches thick. The substratum is olive brown, stratified, very gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Castile and Wareham soils on foot slopes and along drainageways. Also included, adjacent to streams, are areas of soils that are subject to flooding. Also included are small areas of soils in the northern part of the survey area that have a red subsoil and a few areas of soils that do not have cobblestones in the surface layer. Also included, in some units, are sand and gravel pits and small rock outcrops. Included areas are 1/4 to 3 acres and make up about 20 percent of the map unit.

The seasonal high water table in this Hinckley soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is rapid in the surface layer and the subsoil and very rapid in the substratum. Surface runoff is medium. The capacity of the soil to store water available for plant growth is very low or low. Cobblestones and gravel make up 15 to 35 percent of the surface layer and 10 to 60 percent of the subsoil. In unlimed areas the surface layer is extremely acid to moderately acid.

A few areas of this soil are used for cultivated crops and hay. Some areas are in urban and recreation uses. Many areas that have been cleared have reverted to brush and forest.

This soil is suited to some recreation uses and to most types of urban development. The main limitations are slope and cobblestones in the surface layer. If the soil is used for sanitary waste disposal systems, ground water contamination is a hazard because of poor filtering of effluent. Droughtiness and cobblestones on the surface limit the establishment of lawns and sod cover. The soil is a probable source of sand and gravel (fig. 5).

Potential productivity for trees on this soil is low. Seedling mortality is a problem because of droughtiness. Cutting brush and weeds before planting, planting when the soil is moist, and selecting suitable drought-tolerant varieties help to increase the rate of seedling survival. In some areas cobblestones on the surface and slope limit both planting and logging equipment. Red oak and white pine are common in wooded areas.

This soil is moderately suited to some cultivated crops grown in the region, but the crop varieties are restricted because of the relatively short growing season and droughtiness. Slope limits the use of irrigation equipment. Cobblestones and gravel hinder some tillage operations and cause rapid wear of equipment. Natural fertility is generally low, but crops respond well to lime and fertilizer if soil moisture is adequate. Suitable management practices are contour farming, using cover crops, including sod crops in the cropping system, and mixing crop residue into the soil. These practices increase organic matter content, improve soil tilth, increase the water-holding capacity of the soil, and help to control erosion in cropped areas.

This soil is in capability subclass IVe.

HpA—Hinckley-Plainfield complex, level. This map unit consists of deep, excessively drained soils in level areas of outwash plains and on terraces and benches in upland valleys. It is about 45 percent gravelly Hinckley soil, 35 percent sandy Plainfield soil, and 20 percent other soils. Areas of these soils are mostly oval to rectangular and 10 to 50 acres. Hinckley and Plainfield soils are in such an intricate pattern on the landscape that they could not be mapped separately at the scale selected for mapping. Slope ranges from 0 to 3 percent.

Typically, the surface layer of the Hinckley soil is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark gray cobbly sandy loam about 4 inches thick. The subsoil is dark brown very gravelly loamy sand and dark yellowish brown gravelly sand about 23 inches thick. The substratum is olive brown, stratified very gravelly sand to a depth of 60 inches or more.

Typically, the surface layer of the Plainfield soil is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark grayish brown loamy sand about 10 inches thick. The subsoil is about 15 inches thick. In the upper part it is yellowish brown sand, and in the lower part it is light olive brown sand. The substratum is light brownish gray sand to a depth of 60 inches or more.

Included with this unit in mapping are small areas of Castile and Wareham soils on foot slopes and along

Figure 5.—An area of Hinckley cobbly sandy loam, 8 to 15 percent slopes. The soil is a probable source of sand and gravel.

drainageways and several small areas of very poorly drained soils in depressions. Also included, adjacent to streams, are small areas of soils that are subject to flooding. Also included, in the northern part of the survey area, are small areas of soils that have a reddish subsoil. Also included are a few areas of Hinckley soils that do not have cobblestones in the surface layer. Also included, in some map units, are sand and gravel pits and small areas of rock outcrops. Some map units are dominantly Hinckley or Plainfield soil. The included areas are as much as 10 acres.

The seasonal high water table is at a depth of more than 6 feet in both Hinckley and Plainfield soils. Bedrock is generally at a depth of 60 inches or more. In the Hinckley soil permeability, or the rate of water movement through the soil, is rapid in the surface layer and the subsoil and very rapid in the substratum. In the Plainfield soil it is moderately rapid in the surface layer and rapid in the subsoil and the substratum. On both soils surface

runoff is slow. The available water capacity, or the capacity of the soils to store water available for plant growth, is low or very low. Cobblestones and gravel make up 15 to 35 percent, by volume, of the surface layer of the Hinckley soil. Few or no pebbles or cobblestones are in the Plainfield soil. In unlimed areas the surface layer is extremely acid to moderately acid in the Hinckley soil and strongly acid to neutral in the Plainfield soil.

Some areas of the soils in this map unit are used for cultivated crops and hay. Some areas are in recreation and urban uses. Many areas that had been cleared have reverted to brushland and forestland.

These soils are suited to some recreation uses and most urban uses. Many areas of these soils particularly the Plainfield soil, have suitable sites for picnic areas, campgrounds, playgrounds, and paths and trails. In many areas of the Hinckley soil the cobbly surface layer limits these uses.

These soils are suited to most types of urban development. Most areas of the soils have suitable sites for dwellings. If these soils are used as sites for sanitary waste disposal systems, ground water contamination is a hazard because of permeability. The soils absorb the effluent from waste disposal systems but do not adequately filter it. Droughtiness, sandiness, and cobblestones on the surface limit the establishment of lawns and sod cover for playgrounds. The soils are a probable source of sand and gravel.

Potential productivity for trees is low on the Hinckley soil and moderately high on the Plainfield soil. Seedling mortality is high because of droughtiness. Cutting brush and weeds before planting, planting when the soils are moist, and selecting suitable varieties help to improve the rate of seedling survival. On the Hinckley soil, cobblestones on the surface limit the use of equipment for planting seedlings. Red oak, birch, and white pine are common on these soils.

These soils are suited to some cultivated crops grown in the survey area, specifically the crop varieties that are suitable for the relatively short growing season and that are tolerant of droughtiness. Irrigation is feasible in some areas. Cobblestones and gravel hinder some tillage operations and cause rapid wear of equipment. Soil fertility is generally low. Crops respond well to lime and fertilizer if soil moisture is adequate. Cover crops or sod crops and crop residue returned to the soils increase organic matter content, improve soil tilth, and increase the water-holding capacity of the soil.

These soils are in capability subclass IIIs.

HpC—Hinckley-Plainfield complex, sloping. This map unit consists of deep, excessively drained sandy and gravelly soils in gently sloping and sloping areas on outwash plains and on terraces and benches in upland valleys. It is about 45 percent Hinckley soils, 35 percent Plainfield soils, and 20 percent other soils. Areas of these soils are mostly oval to rectangular and 10 to 50 acres. Hinckley and Plainfield soils are in such an intricate pattern on the landscape that they could not be separated at the scale selected for mapping. Slope ranges from 3 to 15 percent.

Typically, the surface layer of the Hinckley soil is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark gray cobbly sandy loam about 4 inches thick. The subsoil is dark brown very gravelly loamy sand and dark yellowish brown gravelly sand about 23 inches thick. The substratum is olive brown stratified very gravelly sand to a depth of 60 inches or more.

Typically, the surface layer of the Plainfield soil is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark grayish brown loamy sand about 10 inches thick. The subsoil is about 15 inches thick. In the upper part it is yellowish brown sand, and in the lower part it is light olive brown sand. The substratum is light brownish gray sand to a depth of 60 inches or more.

Included with this unit in mapping are small areas of Castile and Wareham soils on foot slopes, in depressions, and along drainageways and several small areas of very poorly drained soils in depressions. Also included, adjacent to streams, are small areas of soils that are subject to flooding. Also included, in the northern part of the survey area, are small areas of soils that have a reddish subsoil. Also included are a few areas of Hinckley soils that do not have cobblestones in the surface layer. Also included, in some units, are sand and gravel pits and small areas of rock outcrops. Some units are dominantly Hinckley or Plainfield soil. The included areas are as much as 10 acres.

The seasonal high water table is at a depth of more than 6 feet in both Hinckley and Plainfield soils. Bedrock is mainly at a depth of 60 inches or more. In the Hinckley soil permeability, or the rate of water movement through the soil, is rapid in the surface layer and the subsoil and very rapid in the substratum. In the Plainfield soil it is moderately rapid in the surface layer and rapid in the subsoil and the substratum. Surface runoff is medium. The capacity of the soils to store water available for plant growth is low or very low. Cobblestones and gravel make up 15 to 35 percent of the surface layer of the Hinckley soil. Few or no pebbles or cobblestones are in the Plainfield soil. In unlimed areas the surface layer is extremely acid to moderately acid in the Hinckley soil and strongly acid to neutral in the Plainfield soil.

A few areas of the soils in this map unit are used for cultivated crops and hay. Some areas are in recreation and urban uses. Many areas that had been cleared have reverted to brushland and forestland.

These soils are suited to some recreation uses and to most urban uses. Many areas, particularly on the Plainfield soil, have suitable sites for picnic areas,

campgrounds, playgrounds, and paths and trails. In some areas slope is a minor limitation. In many areas of the Hinckley soil the cobbly surface layer limits these uses. Most areas have suitable sites for dwellings, but in some areas slope limits site selection. If the soils are used as sites for sanitary waste disposal systems, ground water contamination is a hazard because of poor filtering of effluent. Droughtiness, sandiness, and cobblestones on the surface limit the establishment of lawns and sod cover. The soils are a probable source of sand and gravel.

Potential productivity for trees is low on the Hinckley soil and moderately high on the Plainfield soil. Seedling mortality is high because of droughtiness. Cutting brush and weeds before planting, planting when the soils are moist, and selecting suitable varieties help to increase the rate of seedling survival. On the Hinckley soil cobblestones on the surface limit the use of equipment for planting seedlings. White pine, birch, and red oak are common in wooded areas.

These soils are moderately suited to some deep-rooted crops grown in the region, specifically the crop varieties that are suitable for the relatively short growing season and that are tolerant of droughtiness. Cobblestones and gravel hinder some tillage operations and cause rapid wear of equipment. Soil fertility is generally low. Crops respond well to lime and fertilizer if soil moisture is adequate. Contour farming, cover crops or sod crops, and crop residue mixed into the soils help to increase organic matter content, to improve soil tilth, to increase water-holding capacity, and to control erosion.

These soils are in capability subclass IVe.

HpE—Hinckley-Plainfield complex, steep. This map unit consists of deep, excessively drained soils in moderately steep and steep areas of terraces and benches in upland valleys. It is about 45 percent Hinckley soil, 35 percent Plainfield soil, and 20 percent other soils. Areas of these soils are mostly oval or long and narrow and 10 to 50 acres. Hinckley and Plainfield soils are in such an intricate pattern on the landscape that they could not be mapped separately at the scale selected for mapping. Slope ranges from 15 to 45 percent.

Typically, the surface layer of the Hinckley soil is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark gray cobbly sandy loam. The subsoil is dark brown very gravelly loamy sand and dark yellowish brown gravelly sand about 23 inches thick. The substratum is olive brown, stratified very gravelly sand to a depth of 60 inches or more.

Typically, the surface layer of the Plainfield soil is covered with a thin layer of undecomposed leaf litter. The surface layer is very dark grayish brown loamy sand about 10 inches thick. The subsoil is about 15 inches thick. In the upper part it is yellowish brown sand, and in the lower part it is light olive brown sand. The substratum is light brownish gray sand to a depth of 60 inches or more.

Included with this unit in mapping are small areas of Castile and Wareham soils on foot slopes and along drainageways. Also included, adjacent to streams, are areas of soils that are subject to flooding. Also included, in the northern part of the survey area, are small areas of soils that have a reddish subsoil. Also included are a few areas of Hinckley soils that do not have cobblestones in the surface layer. Also included, in some map units, are sand and gravel pits and small areas of rock outcrops. Some map units are dominantly Hinckley or Plainfield soil. The included areas are as much as 10 acres.

The seasonal high water table is at a depth of more than 6 feet in both Hinckley and Plainfield soils. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the Hinckley soil, is rapid in the surface layer and the subsoil and very rapid in the substratum. In the Plainfield soil it is moderately rapid in the surface layer and rapid in the subsoil and the substratum. On both soils surface runoff is medium or rapid. The capacity of the soils to store water available for plant growth is low or very low. Cobblestones and gravel make up 15 to 35 percent of the surface layer of the Hinckley soil. Few or no pebbles or cobblestones are in the Plainfield soil. In unlimed areas the surface layer is extremely acid to moderately acid in the Hinckley soil and strongly acid to neutral in the Plainfield soil.

A few areas of the soils in this map unit are used for pasture. Some areas are in recreation use. Most areas that had been cleared have reverted to brushland and forestland.

The main limitations of these soils for recreation and urban uses are slope and the sandy and gravelly textures. If the soils are used as sites for sanitary waste disposal systems, ground water contamination is a hazard because of poor filtering of effluent. The soils are a probable source of sand and gravel.

Potential productivity for trees is low for the Hinckley soil and moderately high for the Plainfield soil. Red oak, white pine, and birch are common in wooded areas. Erosion is a hazard on the steep slopes. Seedling mortality is high because of droughtiness. Cutting brush and weeds before planting, planting when the soil is moist, and selecting suitable, drought-tolerant varieties help to improve the rate of seedling survival. Use of planting and harvesting equipment is somewhat limited by slope.

These soils are suited to pasture, but the forage varieties are restricted because of the relatively short growing season and droughtiness. Cobblestones and gravel in the surface layer of the Hinckley soil hinder some tillage operations. Slope also limits the use of equipment. Erosion is a hazard if the soils are

unprotected by plant cover. Overgrazing must be avoided to prevent damage to the protective sod. Soil fertility is generally low.

These soils are in capability subclass VIIe.

HuB—Hudson silt loam, 3 to 8 percent slopes. This is a gently sloping, deep, moderately well drained soil on smooth or undulating plains. Most areas are oval and range from 5 to 20 acres.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil is mottled, brown silty clay 16 inches thick. A layer of brown silty clay loam 7 inches thick separates the surface layer and the subsoil. The substratum is mottled, grayish brown silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Rhinebeck and Madalin soils in depressions and along drainageways. Also included are a few areas of Elmridge soils. Areas of the included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Hudson soil is at a depth of 1 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately slow to moderate in the surface layer and slow or very slow in the subsoil and the substratum. Surface runoff is medium. The capacity of the soil to store water available for plant growth is high. Rock fragments make up less than 5 percent of the soil. In unlimed areas the surface layer is strongly acid to neutral.

Many areas of this soil are used for farming. Some areas are used for recreation, and the rest is forested.

This soil is suited to many recreation uses. The main limitations are the seasonal high water table and the permeability in the subsoil and the substratum. In some areas erosion is a serious hazard on paths and trails. Ponds and habitat for wetland wildlife are generally difficult to develop because of droughtiness in midsummer and the difficulty of compacting embankments. The main limitations of the soil for many urban uses are the seasonal high water table, the permeability in the subsoil and the substratum, and high potential frost action.

Potential productivity for trees on this soil is high. Red oak, sugar maple, and white ash are common on this soil. Planting when the soil is moist and removing weeds and brush help to improve the rate of seedling survival. Erosion is a hazard on skid trails. Laying out trails across the slope helps to control erosion.

This soil is well suited to cultivated crops, hay, and pasture. In some years the seasonal high water table delays planting in spring and harvesting in fall. Erosion is a hazard, particularly on long slopes. If tilled when too wet, the soil clods and puddles easily. Contour farming, cover crops, and conservation tillage systems that return crop residue to the soil helps to increase organic matter content, to improve soil tilth, and to control erosion. On pasture, during wet periods restricted grazing helps to prevent soil compaction.

This soil is in capability subclass IIe.

HuC—Hudson silt loam, 8 to 15 percent slopes. This is a sloping, deep, moderately well drained soil on smooth side slopes or in rolling areas on plains. The soil has a high content of silt and clay. Most areas are oval and range from 5 to 20 acres.

Typically, the surface layer is dark brown silt loam about 7 inches thick. The subsoil is mottled, brown silty clay about 16 inches thick. A layer of brown silty clay loam 7 inches thick separates the surface layer and the subsoil. The substratum is mottled, grayish brown silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Rhinebeck and Madalin soils in depressions and along drainageways. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Hudson soil is at a depth of 1 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately slow or moderate in the surface layer and slow or very slow in the subsoil and the substratum. Surface runoff is rapid. The capacity of the soil to store available water for plant growth is high. Rock fragments make up less than 5 percent of the soil. In unlimed areas the surface layer is strongly acid to neutral.

Some areas of this soil are used for farming. Some areas are also used for recreation, and the rest is forested.

This soil is suited to some recreation uses.

The limitations to use of the soil as sites for campgrounds and picnic areas are slope, the seasonal high water table, and the permeability in the subsoil. Ponds and habitat for wetland wildlife are difficult to develop because of slope and the difficulty of compacting embankments. The soil is poorly suited to most types of community development. The main limitations are the seasonal high water table in spring, slope, and the permeability in the subsoil and the substratum. The soil tends to slump if foot slopes are excavated.

Potential productivity for trees on this soil is high. Erosion is a moderate hazard during timber harvest. Proper design and construction on skid trails and logging roads help to control erosion. Planting when the soil is moist and removing weeds and brush help to improve the rate of seedling survival. Red oak, sugar maple, and birch are common in wooded areas.

This soil is suited to cultivated crops, hay, and pasture. Erosion is a serious hazard, particularly on long slopes unprotected by plant cover. Contour farming, cover crops, and conservation tillage systems that return crop residue to the soil help to control erosion, to increase organic matter content, and to improve soil tilth. In some

years wetness delays planting in spring and harvesting in fall. If tilled when too wet, the soil clods and puddles easily. Restricted grazing and restricted use of equipment during wet periods help to prevent soil compaction.

This soil is in capability subclass IIIe.

LmC—Lyman-Rock outcrop complex, sloping. This map unit consists of shallow, somewhat excessively drained Lyman soil and areas of Rock outcrop on hillsides, crests of hills, and mountaintops. It is about 55 percent Lyman soil, 20 percent Rock outcrop, and 25 percent other soils. Areas of this map unit are mostly irregular in shape and range from 10 to 100 acres. Stones and boulders about 5 to 30 feet apart are on the surface. The Lyman soil and areas of Rock outcrop are so intermingled that it was not practical to map them separately at the scale selected for mapping. Slope ranges from 3 to 15 percent, but are dominantly more than 5 percent.

Typically, the surface layer of the Lyman soil is very dark gray fine sandy loam about 2 inches thick. The subsoil is dark reddish brown, reddish brown, and brown fine sandy loam about 15 inches thick. Granite bedrock is at a depth of about 17 inches.

Included with this unit in mapping are small areas of deep Marlow, Hermon, and Peru soils. Also included are areas of soils that are less than 10 inches deep and soils that are 20 to 40 inches deep to bedrock. Also included are areas of stone rubble accumulated at the base of some slopes and areas of soils where numerous stones and boulders are on the surface. Also included, on the tops of the higher mountains, are areas of soils that have a slightly colder average summer soil temperature than this Lyman soil. Areas of included soils are 3 to 10 acres.

A seasonal high water table does not occur in the Lyman soil above bedrock, which is at a depth of 8 to 20 inches. Permeability, or the rate of water movement through the soil, is moderately rapid. Surface runoff is medium. The capacity of the soil to store water available for plant growth is low or very low. Rock fragments make up 5 to 35 percent of the soil. The surface layer is extremely acid to moderately acid.

Most areas of the Lyman soil in this map unit are forested.

This Lyman soil is poorly suited to most recreation and urban uses. The gently sloping areas where the Lyman soil is predominant have suitable sites for campgrounds and picnic areas. Shallow depth to bedrock is a limitation to these uses. Paths and trails can be established throughout the areas of this map unit. Other recreation and urban uses are limited by depth to bedrock, numerous rock outcrops, droughtiness, and stones and boulders on the surface.

Potential productivity for timber trees on this Lyman soil is moderate. The rate of seedling survival is low because of droughtiness during some parts of most years. Windthrow is a hazard because the root zone is restricted by the shallow depth to bedrock. Rock outcrops and stones and boulders on the surface limit the use of equipment for planting seedlings and harvesting timber. Sugar maple and white spruce are common in wooded areas.

This Lyman soil is not suited to cultivated crops because of depth to bedrock, numerous areas of rock outcrops, stones on the surface, and the short growing season.

This Lyman soil is in capability subclass VIs.

LmE—Lyman-Rock outcrop complex, steep. This map unit consists of shallow, somewhat excessively drained Lyman soil and areas of Rock outcrop on mountainsides and sides of ridges in upland areas. Areas of this map unit are mostly irregular or long and narrow in shape and 10 to 100 acres. Stones and boulders about 5 to 30 feet apart are on the surface. It is about 55 percent Lyman soil, 30 percent rock outcrop, and 20 percent other soils. The Lyman soil and areas of Rock outcrop are so intermingled that it was not practical to map them separately at the scale selected for mapping. Slope ranges from 15 to 45 percent, but is dominantly more than 25 percent.

Typically, the surface layer of the Lyman soil is very dark gray fine sandy loam about 2 inches thick. The subsoil is dark reddish brown, reddish brown, and brown fine sandy loam about 15 inches thick. Granite bedrock is at a depth of about 17 inches.

Included with this complex in mapping are small areas of deep Marlow, Hermon, and Peru soils. Also included are areas of soils that are less than 10 inches deep and soils that are 20 to 40 inches deep to bedrock. Also included are areas of stone rubble accumulated at the base of slopes and a few areas of soils where numerous stones and boulders are on the surface. Also included, on the tops of higher mountains, are areas of soils that have slightly colder average summer soil temperatures than this Lyman soil. Areas of included soils are 3 to 10 acres.

A seasonal high water table does not occur in the Lyman soil above the bedrock, which is at a depth of 8 to 20 inches. Permeability, or the rate of water movement through the soil, is moderately rapid. Surface runoff is rapid. The capacity of the soil to store water available for plant growth is very low or low. Rock fragments make up 5 to 35 percent of the soil. The surface layer is extremely acid to moderately acid.

Most areas of the Lyman soil in this map unit are forested.

The Lyman soil in this map unit is not suited to most recreation or urban uses because of slope, shallow depth to bedrock, numerous boulders on the surface, and rock outcrops. Some moderately steep areas are suitable for paths and trails.

Potential productivity for trees on this soil is moderate. The rate of seedling survival is low because of droughtiness during some parts of most years. Windthrow is a hazard because the root zone is restricted by the shallow depth to bedrock. Rock outcrops, slope, and stones and boulders on the surface limit the use of equipment for planting seedlings and harvesting timber. Sugar maple and white spruce are common in forested areas.

This Lyman soil is not suited to cultivated crops because of slope, depth to bedrock, rock outcrops, and the short growing season.

This Lyman soil is in capability subclass VIIs.

LnA—Lyme fine sandy loam, 0 to 3 percent slopes. This is a nearly level, deep, poorly drained soil in low-lying areas and along small drainageways on uplands. Most areas are long and narrow, and range from 5 to 20 acres.

Typically, the surface layer is covered with a thin layer of leaf litter. The surface layer is black fine sandy loam 8 inches thick. The subsoil is mottled and about 17 inches thick. In the upper part it is dark grayish brown fine sandy loam, in the middle part it is dark yellowish brown fine sandy loam, and in the lower part it is dark grayish brown sandy loam. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Schroon soils. Also included are a few areas of soils that are similar to this Lyme soil but are somewhat poorly drained. Also included are areas of soils that have a mucky surface layer less than 10 inches thick and areas of soils where some to many stones are on the surface. Areas of included soils are 1/4 to 3 acres and make up about 15 percent of the map unit.

In spring and during wet periods the seasonal high water table in this Lyme soil is between the surface and a depth of 1 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is slow or very slow. The capacity of the soil to store available water for plant growth is moderate. Rock fragments make up to 5 to 15 percent of the surface layer and 5 to 20 percent of the subsoil. In unlimed areas the surface layer is very strongly acid or strongly acid.

Most areas of this soil are forested or are covered with brush and natural wetland shrubs.

This soil is not suited to most recreation and urban uses. It generally has suitable sites for ponds or habitat for wetland wildlife. Most other uses are seriously limited by the seasonal high water table and high potential frost action.

Potential productivity for trees on this soil is moderate. The seasonal high water table restricts growth and limits the use of equipment for planting seedlings and harvesting timber. Windthrow is a hazard because of the restricted root zone. Red maple, red spruce, yellow birch, and other water-tolerant species are common on this soil.

This soil is suited to use as pasture during dry periods of the year. In most years, it is only moderately suited to field crops. The main limitation is the seasonal high water table. If drained, this soil is suited to some crops grown in the region, although the growing season is short. In most areas outlets for drainage systems are difficult to find because of the low position of the soil on the landscape. In places surface stones limit the use of farm equipment.

This soil is in capability subclass IVw.

LyA—Lyme very stony fine sandy loam, nearly level. This is a nearly level to gently sloping, deep, poorly drained soil in low-lying areas and along small drainageways on uplands. Stones about 5 to 30 feet apart are on the surface. Most areas are oval, or long and narrow and range from 10 to 80 acres. Slope ranges from 0 to 8 percent, but are dominantly 0 to 3 percent.

Typically, the surface layer is covered with a layer of decomposed leaf litter. The surface layer is black fine sandy loam 8 inches thick. The subsoil is mottled and about 17 inches thick. In the upper part it is dark grayish brown fine sandy loam, in the middle part it is dark yellowish brown fine sandy loam, and in the lower part it is dark grayish brown sandy loam. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Schroon and Peru soils. Also included are some areas of somewhat poorly drained soils that have a firm, dense substratum and areas of Cathro and Greenwood soils in low bogs. Areas of included soils are as much as 10 acres and make up about 30 percent of the map unit.

In spring and during wet periods the seasonal high water table in this Lyme soil is between the surface and a depth of 1 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is slow or very slow. The capacity of the soil to store available water for plant growth is moderate. Rock fragments make up to 5 to 15 percent of the surface layer and 5 to 20 percent of the subsoil. Numerous stones and boulders are on the surface. In unlimed areas the surface layer is very strongly acid or strongly acid.

Most areas of this soil are forested or are covered with brush and wetland shrubs.

This soil is not suited to most recreation and community development uses because of the seasonal high water table, high potential frost action, and numerous stones on the surface. Many areas have sites for ponds or for habitat for wetland wildlife.

Potential productivity for trees on this soil is moderate. The seasonal high water table restricts root growth and

limits the use of equipment for harvesting timber and planting seedlings. Windthrow is a hazard during very windy periods because the water table restricts the root zone. Red maple, red spruce, and yellow birch are common on this soil.

This soil is not suited to cultivated crops because of the seasonal high water table and large stones on the surface. In most areas drainage outlets are not available because of the low position of this soil on the landscape. Undrained areas are suited to midsummer pasture, although large stones on the surface limit reseeding and liming.

This soil is in capability subclass VIIs.

Ma—Madalin silt loam. This is a nearly level, deep, poorly drained and very poorly drained soil in flat or depressional areas on plains and in small basins in upland areas. The soil has a high content of silt and clay. Areas are mostly oval to rectangular and range from 3 to 50 acres, but are commonly 5 to 10 acres. Slope ranges from 0 to 3 percent.

Typically, the surface layer is very dark gray silt loam about 6 inches thick. The subsoil is about 34 inches thick. In the upper part it is dark grayish brown, and in the lower part it is gray silty clay. The substratum is gray silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hudson and Rhinebeck soils on knolls and benches. Also included are areas where the underlying substratum is loamy or sandy. Areas of included soils are 1 to 3 acres and make up less than 10 percent of the map unit.

The seasonal high water table in this Madalin soil is at or near the surface most of the year. Bedrock is generally at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately slow in the surface layer, slow in the subsoil, and slow or very slow in the substratum. Surface runoff is slow or very slow. The capacity of the soil to store water available for plant growth is high. Rock fragments make up 0 to 2 percent of the surface layer and the subsoil. In unlimed areas the surface layer is strongly acid to neutral.

Most areas of this soil are idle and covered with water-tolerant grass, brush, and small trees. Drained areas are used for hay and pasture.

This soil is poorly suited to most recreation and urban uses. The main limitations are the seasonal high water table, permeability in the subsoil, and high potential frost action. Some areas have sites for ponds, but embankments or dikes constructed with this soil tend to erode and slump. Ponds are generally slow to refill.

Potential productivity for trees on this soil is low. The seasonal high water table restricts the root zone; consequently, windthrow is a hazard. The seasonal high water table limits the use of equipment for harvesting timber and planting seedlings. Water-tolerant species are suitable on this soil. Red maple, white cedar, and hemlock are common in forested areas.

In undrained areas this soil is only moderately suited to pasture. If drained, it is suited to hay and some row crops. During wet periods restricted grazing and limited use of equipment help to prevent surface compaction and crusting of the surface layer. In drained areas cover crops and sod crops in the cropping system help to maintain soil tilth and to prevent surface crusting and clodding.

This soil is in capability subclass IVw.

MrC—Marlow very bouldery fine sandy loam, sloping. This is a deep, well drained soil on hillsides and crests of hills on uplands. Boulders and stones 5 to 30 feet apart are on the surface. Most areas are oval or round and 10 to 100 acres. Slope ranges from 3 to 15 percent but are dominantly 8 to 12 percent.

Typically, the surface layer is covered with a decomposed leaf mat. The surface layer is black and grayish brown fine sandy loam 6 inches thick. The subsoil is dark reddish brown, dark brown, and olive brown gravelly fine sandy loam 22 inches thick. The substratum is very firm, grayish brown gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Peru and Lyme soils in nearly level areas, along drainageways, and in depressions. Also included in a few places are areas of Hermon soils, which do not have a dense, firm substratum, and areas of Lyman soils, which are shallow to bedrock. Also included are some areas of soils that have a coarse textured substratum. Also included, at elevations below 1,000 feet, are areas of Stowe, Bice, and shallow Woodstock soils. Also included are areas where numerous stones and boulders are on the surface and areas of rock outcrops. The included areas are 3 to 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Marlow soil is at a depth of 2 to 3 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and the subsoil and slow or moderately slow in the very firm, dense substratum. Water tends to move laterally along the top of the very firm layer. Surface runoff is medium. The capacity of the soil to store water available for plant growth is moderate. In unlimed areas the surface layer is extremely acid to moderately acid.

Most areas of this soil are forested. Areas that had been cleared for farming have mostly reverted to brush or forest. Some areas are used for recreation, and a few areas are used for pasture.

This soil is moderately suited to many recreation and urban uses. Some areas have suitable sites for picnic areas, campgrounds, and paths and trails. The limitations to these uses are permeability in the substratum, boulders and stones on the surface, and slope. Ponds

and habitat for wetland wildlife are difficult to develop because of the seasonal high water table and slope. In urban development, the firm, dense substratum causes wetness around buildings and limits the operation of septic tank absorption fields. Other limitations are slope and boulders on the surface.

Potential productivity for trees on this soil is moderately high. Sugar maple, paper birch, yellow birch, and white pine are common on this soil. Numerous boulders and stones on the surface somewhat limit harvesting timber and planting seedlings.

This soil is not suited to cultivated crops because of boulders and stones on the surface and the short growing season. Some areas are suitable for pasture, but boulders on the surface limit mowing, reseeding, and applying fertilizer.

This soil is in capability subclass VIs.

MrE—Marlow very bouldery fine sandy loam, steep. This is a deep, well drained soil on hillsides and mountainsides in upland areas. Boulders and stones 5 to 30 feet apart are on the surface. Most areas are oval or elongated and 10 to 100 acres. Slope ranges from 15 to 45 percent, but is dominantly 20 to 30 percent.

Typically, the surface layer is covered with a thin, decomposed leaf mat. The surface layer is black and grayish brown fine sandy loam about 6 inches thick. The subsoil is dark reddish brown, dark brown, and olive brown gravelly fine sandy loam about 22 inches thick. The substratum is very firm, grayish brown gravelly sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Peru and Lyme soils in gently sloping areas, along drainageways, and in depressions. Also included in some places, are areas of Hermon soils, which do not have a dense firm substratum, and areas of Lyman soils, which are shallow to bedrock. Also included are some areas of soils that have a coarse-textured substratum. Also included, at elevations below 1,000 feet, are areas of Stowe, Bice, and shallow Woodstock soils. Also included are areas of soils where numerous stones or boulders are on the surface and areas of rock outcrops. The included areas are 3 to 10 acres and make up about 25 percent of the map unit.

The seasonal high water table in this Marlow soil is at a depth of 2 to 3 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and the subsoil and slow or moderately slow in the very firm, dense substratum. Water tends to move laterally along the top of the very firm layer. Surface runoff is rapid. The capacity of the soil to store water available for plant growth is moderate. In unlimed areas the surface layer is extremely acid to moderately acid.

Most areas of this soil are forested.

This soil is poorly suited to most recreation and urban uses. The main limitations to these uses are slope and boulders and stones on the surface. The main recreation use is for hiking paths and trails.

Potential productivity for trees on this soil is moderately high. Slope and numerous boulders and stones on the surface limit harvesting timber and planting seedlings. Logging trails placed on the contour help to control erosion and gullying. White pines, sugar maple, and birch are common on this soil.

This soil is not suited to cultivated crops because of the short growing season, slope, and boulders and stones on the surface. Some areas are suited to unimproved pasture.

This soil is in capability subclass VIIs.

MsA—Massena fine sandy loam, 0 to 3 percent slopes. This is a nearly level, deep, somewhat poorly drained or poorly drained soil in low-lying, wet areas and along small drainageways on uplands. Most areas are long and narrow and range from 5 to 20 acres.

Typically, the surface layer is very dark gray fine sandy loam about 8 inches thick. The subsoil is about 16 inches thick. In the upper part it is grayish brown fine sandy loam, in the middle part it is brown fine sandy loam, and in the lower part it is grayish brown fine sandy loam. The substratum is grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Sutton soils on knolls and low ridges. Also included are some areas of somewhat poorly drained soils that have a firm, dense substratum. Also included are soils that have a mucky surface layer less than 10 inches thick and areas of soils where few to many stones are on the surface. Areas of included soils are 1/4 to 3 acres and make up about 10 percent of the map unit.

In spring and during wet periods the seasonal high water table in this Massena soil is at a depth of 1/2 to 1 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and moderately slow or slow in the subsoil and the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 35 percent of the subsoil. In unlimed areas the surface layer is moderately acid to neutral.

Most areas of this soil are forested or covered with brush and shrubs.

This soil is poorly suited to most recreation and urban uses because of the seasonal high water table, permeability in the subsoil, and high potential frost action. Subsurface drainage is needed around foundations to keep basements dry. Many areas have sites for ponds or habitat for wetland wildlife.

Potential productivity for trees on this soil is moderately high. The seasonal high water table restricts root growth and limits the use of equipment for harvesting timber. Windthrow is a hazard because of the

restricted root zone. Red maple, white spruce, and white cedar are common on this soil.

This soil is suited to pasture during dry periods of the year. In most areas suitable outlets for drainage systems are difficult to find because of the low position of the soil on the landscape. If drained, the soil is suited to most crops grown in the region. In places, surface stones limit the use of farm equipment. If cultivated crops are grown, practices such as use of cover crops and sod crops in the cropping system help to maintain soil tilth.

This soil is in capability subclass IIIw.

Mu—Middlebury fine sandy loam. This is a nearly level, deep, moderately well drained and somewhat poorly drained soil on flood plains in valleys. Most areas are long and narrow and range from 3 to 20 acres. Slope ranges from 0 to 3 percent.

Typically, the surface layer is very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is brown and mottled, olive brown fine sandy loam about 30 inches thick. The substratum is mottled, dark yellowish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Tioga soils. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit. Also included are units at elevations above 1,000 feet and in the northern part of the survey area, where the soils have cooler temperatures than this Middlebury soil.

The seasonal high water table in this Middlebury soil is at a depth of 1/2 foot to 2 feet in spring. Flooding occasionally occurs mostly in spring. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate. Surface runoff is slow. The capacity of the soil to store water available for plant growth is high. In unlimed areas the surface layer is strongly acid to slightly acid.

Most areas of this soil are forested. Some areas have been cleared and are used for farming.

This soil is poorly suited to most recreation and urban uses because of flooding, the seasonal high water table, and high potential frost action. Some areas are suited to ponds, although in some areas seepage is a problem and cutbanks commonly cave. The lower part of the substratum is commonly a source of sand or gravel.

Potential productivity for trees on this soil is high. Aspen, red maple, and sugar maple are common on this soil. Most species used in reforestation in this region grow well on this soil. There are few limitations to woodland management.

This soil is well suited to most crops grown in the region, but in some years occasional flooding in late spring damages crops. In some areas the seasonal high water table delays planting of some crops. Use of the soil for pasture or sod crops in the cropping system help to control erosion and surface scouring by floodwaters and to maintain soil tilth. Crops respond well to lime and fertilizer.

This soil is in capability subclass IIw.

OaA—Oakville loamy fine sand, 0 to 3 percent slopes. This is a nearly level, deep, well drained soil on outwash plains. Areas of this soil are broad and oval and range from 5 to 50 acres.

Typically, the surface layer is dark brown loamy fine sand about 8 inches thick. The subsoil is yellowish brown and light olive brown sand about 19 inches thick. The substratum is light olive brown and dark grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of Elnora and Hinckley soils. Also included, on elevated benches adjacent to large streams, are small areas of well drained Tioga soils. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Oakville soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of more than 60 inches. Permeability, or the rate of water movement through the soil, is rapid. Surface runoff is very slow. The capacity of the soil to store water available for plant growth is low. Rock fragments make up less than 3 percent of the surface layer and the subsoil. The surface layer is strongly acid to neutral.

Most areas of this soil have been cleared, but many areas are reverting to forest or are used for urban development.

This soil is well suited to most recreation and urban uses, such as camp sites, playgrounds, and dwellings with basements. The sandy texture and droughtiness limit the establishment of lawns or sod cover for homesites, playgrounds, and golf courses. If the soil is used for septic tank absorption fields or sanitary landfills, ground water contamination is a hazard because of poor filtering of effluent. Ponds and habitat for wetland wildlife are difficult to establish because of seepage and the depth to the water table. This soil is a potential source of sand.

Potential productivity for trees on this soil is moderately high. The sandy texture and droughtiness cause a high rate of seedling mortality and somewhat limit tree growth. Red oak, yellow birch, and red pine are common in forested areas.

This soil is moderately suited to cultivated crops. The main limitations are low natural fertility and droughtiness. Permanent sod crops and cover crops help to increase organic matter content, improve soil tilth, and increase the water-holding capacity of the soil. If irrigation water is available, the soil is suited to vegetable crops. The soil is suited to pasture in spring and early summer.

This soil is in capability subclass IVs.

OaB—Oakville loamy fine sand, 3 to 8 percent slopes. This is a gently sloping, deep, well drained soil

on outwash plains. Most areas are broad and oval and range from 5 to 40 acres.

Typically, the surface layer is dark brown loamy fine sand about 8 inches thick. The subsoil is yellowish brown and light olive brown sand about 19 inches thick. The substratum is light olive brown and dark grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of Elnora and Hinckley soils. Also included, adjacent to large streams, are small areas of well drained Tioga soils. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Oakville soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of more than 60 inches. Permeability, or the rate of water movement through the soil, is rapid. Surface runoff is slow. The capacity of the soil to store water available for plant growth is low. Rock fragments make up less than 3 percent of the surface layers and the subsoil. The surface layer is strongly acid to neutral.

Most areas of this soil have been cleared, but many areas are reverting to forest or are used for urban development.

This soil is well suited to most recreation and urban uses. The sandy texture and droughtiness limit the establishment of lawns or sod cover for golf courses and playgrounds. If the soil is used as sites for septic tank absorption fields or sanitary landfills, ground water contamination is a hazard because of poor filtering of effluent. Ponds and habitat for wetland wildlife are difficult to establish because of seepage and the depth to the water table. The soil is a potential source of sand.

Potential productivity for trees on this soil is moderately high. The sandy texture and droughtiness cause a high rate of seedling mortality and somewhat limit tree growth. Red oak, yellow birch, and red pine are common in forested areas.

This soil is moderately suited to cultivated crops. The main limitations are low natural fertility and droughtiness. If irrigated, this soil can produce high yields of vegetable crops. Irrigation is somewhat more difficult on this soil than on nearly level Oakville soils. Permanent sod crops or cover crops help to increase organic matter content, to improve soil tilth, and to increase the water-holding capacity of the soil. This soil is suited to pasture in spring and early summer.

This soil is in capability subclass IVs.

OaC—Oakville loamy fine sand, 8 to 15 percent slopes. This is a sloping, deep, well drained soil on dissected side slopes and knolls on outwash plains. Most areas are long and narrow and range from 5 to 20 acres.

Typically, the surface layer is dark brown loamy fine sand about 8 inches thick. The subsoil is yellowish brown and light olive brown sand about 19 inches thick. The substratum is light olive brown and dark grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are areas of Elnora and Hinckley soils. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Oakville soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of more than 60 inches. Permeability, or the rate of water movement through the soil, is very rapid. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is low. Gravel makes up less than 5 percent of the surface layer and the subsoil. In unlimed areas the surface layer is strongly acid.

Most areas of this soil are forested. Oak, white pine, and birch are common on this soil.

This soil is moderately suited to most recreation and urban uses. Slope is the main limitation to such uses as campsites, roads and streets, and homesites. Droughtiness and the sandy texture are limitations to establishing lawns and sod cover. If the soil is used as sites for septic tank absorption fields and sanitary landfills, ground water contamination is a hazard because of poor filtering of the effluent. The soil is a potential source of sand.

Potential productivity for trees on this soil is moderately high. Seedling mortality is high because of the sandy texture and droughtiness. Logging trails placed on the contour help to control erosion and gullying. Red oak, yellow birch, and red pine are common in wooded areas.

This soil is poorly suited to cultivated crops because of slope, low natural fertility, and droughtiness. Permanent sod crops and cover crops help to control erosion, to increase organic matter content, to improve soil tilth, and to increase the water-holding capacity of the soil. Some areas are suited to pasture in spring and early summer.

This soil is in capability subclass VIe.

Pa—Palms muck. These are nearly level, very poorly drained, organic soils in depressions in low flat areas in both upland and lowland areas. Most areas are oval and range from 10 to 80 acres. Slope ranges from 0 to 2 percent.

Typically, the uppermost 25 inches of the soil is black, decomposed organic material (muck). The substratum is mottled, gray silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of deep Carlisle soils. Also included are areas of Madalin and Wareham soils, which have a surface layer high in organic matter but are dominantly mineral soils. Also included, adjacent to ponds and lakes, are areas of Saprists and Aquepts. Areas of included soils are 1 to 3 acres and make up about 20 percent of the map unit.

The seasonal high water table is between the surface and a depth of less than 1 foot much of the year. Some

areas are ponded in spring. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately slow to moderately rapid in the organic layer and moderate or moderately slow in the substratum. Surface runoff is very slow or ponded. The capacity of the soil to store water available for plant growth is very high. The surface layer is strongly acid to mildly alkaline.

Most areas of this soil are forested or are in swamp vegetation of grasses, reeds, and hedges.

This soil is not suited to most recreation and urban uses because of the seasonal high water table, hazard of ponding, and high compressibility of the organic soil material. It is well suited to use as habitat for wetland wildlife.

Potential productivity for trees on this soil is moderate. The seasonal high water table restricts growth, limits the use of equipment for timber harvesting, and restricts the root zone. Windthrow is a hazard because of the restricted root zone. Seedlings of water-tolerant species are suitable for planting. Red maple, white ash, and quaking aspen are common in wooded areas.

Undrained areas of this soil are not suited to crops or pasture. If drained, this soil is well suited to the vegetable crops grown in the region, but most areas of the soil are small. Also, in most areas suitable drainage outlets are difficult to find; consequently, in those areas drainage is impractical.

These soils are in capability subclass Vw.

PbB—Paxton fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, well drained soil in smooth, sloping areas on uplands. A very dense, firm layer is at a depth of 18 to 36 inches. Most areas are oblong and range from 5 to 75 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is about 21 inches thick. In the upper 9 inches it is yellowish brown fine sandy loam, and in the lower 12 inches it is light olive brown fine sandy loam. The substratum is a firm, dense layer of grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Woodbridge soils. Also included in low-lying areas, on foot slopes, and along drainageways, are somewhat poorly drained to poorly drained soils that have a dense, firm substratum. Also included are small areas of Massena soils in depressions and small areas of Charlton soils, which do not have a firm, dense substratum. Also included, in places, are small areas of Woodstock soils that are less than 20 inches deep to bedrock. Also included, in some map units, are small areas of soils where stones are on the surface. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Paxton soil is perched above the firm, dense substratum at a depth of 1 1/2 to 2 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and the subsoil and moderately slow or slow in the dense substratum. Surface runoff is medium. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil are forested or are covered by a mixture of brush and young trees. Some areas are used for farming and urban development.

The soil is moderately suited to most recreation and urban uses. The main limitation to use as camp areas, playgrounds, and septic tank absorption fields is permeability in the substratum. The soil commonly has sites for diked ponds. The seasonal high water table is a limitation for homesites. Potential frost action is a limitation for local roads and streets.

Potential productivity for trees on this soil is moderately high. Red oak, sugar maple, hemlock, and white pine are common on the soil. There are few limitations to woodland management, except in some years the rate of seedling survival is low because of droughtiness.

This soil is well suited to most cultivated crops grown in the region. Erosion is a hazard in areas unprotected by plant cover and on long slopes. Cover crops or sod crops and a conservation tillage system that returns crop residue to the soil help to control erosion, to increase organic matter content, and to improve soil tilth. Crops generally respond well to lime and fertilizer if soil moisture is adequate. In some areas surface stones limit the use of tillage equipment.

This soil is in capability subclass IIe.

PbC—Paxton fine sandy loam, 8 to 15 percent slopes. This is a gently sloping, deep, well drained soil on hillsides on uplands. A very dense, firm layer is at a depth of about 15 to 36 inches. Most areas are oblong and range from 5 to 75 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is 2 1/2 inches thick. In the upper 9 inches it is yellowish brown fine sandy loam. In the lower 12 inches it is light olive brown fine sandy loam. The substratum is a firm, dense layer of grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Woodbridge soils. Also included are small areas of Charlton soils, which do not have a firm, dense substratum, and Woodstock soils, which are less than 20 inches deep to bedrock. Also included, in places, are Massena soils along drainageways. Also included in some map units, are small areas of rock outcrops and areas where stones are on the surface. The included

areas are 1 to 3 acres and make up 10 percent of the map unit.

The seasonal high water table in this Paxton soil is perched above the firm, dense substratum at a depth of 1 1/2 to 2 1/2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the upper part and moderately slow or slow in the substratum. Surface runoff is medium. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. In unlimed areas the surface layer is very strongly acid to slightly acid.

Most areas of this soil are forested or are covered by a mixture of brush and young trees. Some areas are used for farming or urban development.

This soil is moderately suited to some recreation and urban uses. Slope is a limitation for playgrounds. Permeability in the substratum is a limitation for campgrounds and picnic areas. Ponds and habitat for wetland wildlife are difficult to develop because of slope. Permeability in the substratum is a limitation for septic tank absorption fields. Slope and the seasonal high water table are limitations for homesites.

Potential productivity for trees on this soil is moderately high. Red oak, sugar maple, hemlock, and white pine are common on this soil. Laying out logging trails on the contour helps to control erosion. There are few limitations to woodland management, except in dry years seedling mortality is high.

This soil is suited to cultivated crops and pasture. Erosion is a serious hazard in areas unprotected by plant cover and in areas where slope is long. Sod crops in the cropping system, contour farming, and conservation tillage systems that return crop residue to the surface help to control erosion and to improve soil tilth. In some areas stones on the surface limit the use of equipment.

This soil is in capability subclass IIIe.

PeB—Peru very bouldery loam, gently sloping. This is a deep, moderately well drained soil on hillsides and foot slopes in upland areas. Boulders 5 to 30 feet apart are on the surface. A very firm, dense layer is in the substratum. Most areas are long and narrow and range from 10 to 25 acres. Slope ranges from 3 to 15 percent, but is dominantly 3 to 8 percent.

Typically, the surface layer is very dark grayish brown loam about 8 inches thick. The subsoil is about 20 inches thick. It is dark reddish brown and dark yellowish brown fine sandy loam that is mottled in the lower part. The substratum is a mottled, dark grayish brown, very firm, dense layer of sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Marlow soils on knolls and Lyme soils in depressions and along drainageways. Also included are areas of nearly level soils. Areas of included soils are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Peru soil is perched above the substratum at a depth of 1 to 2 feet in winter and spring. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the upper part and moderately slow or slow in the substratum. Surface runoff is medium. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. In unlimed areas the surface layer is extremely acid to moderately acid.

Most areas of this soil are forested. Most areas that had been cleared for farming have reverted to forest.

This soil is moderately suited to many recreation uses. The limitations for campsites and picnic areas are the seasonal high water table after rainy periods, permeability in the substratum, large stones on the surface, and, in some areas, slope. The gently sloping areas have suitable sites for diked ponds. Habitat for wetland wildlife is difficult to develop because of slope and the fluctuating water table. This soil is poorly suited for most urban uses. The seasonal high water table is a limitation for homesites. The high potential frost action is a limitation for local roads and streets. Permeability in the substratum is a limitation for septic tank absorption fields.

Potential productivity for trees on this soil is moderately high. White pine, birch, sugar maple, and hemlock are common on this soil. There are few limitations to woodland management.

This soil is not suited to cultivated crops because of large stones on the surface. If cleared, it is suited to pasture, but the growing season is short. The seasonal high water table in spring and after rainy periods somewhat limits tillage operations.

This soil is in capability subclass VIs.

Pg—Pits, sand and gravel. This map unit consists of excavations mainly in areas of gravelly and sandy soils. The pits were made by removing gravel or sand for construction purposes. They are 3 to 50 feet deep. The sides are generally steep, and the floor is relatively level. Stones and boulders in piles are commonly scattered over the pit floor. Some pits have small pools of water. The excavations are commonly irregular in shape, and shape varies with the deposits and ownership boundaries. The pits range from 2 to 30 acres or more.

These pits are generally bare of vegetation, although some older ones have scattered bushes and grass. The soils in the pits are generally low in moisture available for plant growth. Permeability, or the rate of water movement through the soils, differs from place to place, but generally it is moderately rapid to very rapid. Included in mapping are some excavations in areas of loamy soils generally along major highways.

The potential of areas of this map unit for urban and recreation uses ranges from good to poor. If the areas are used as sites for septic tank absorption fields and sanitary landfills, ground water contamination is a hazard because of permeability of the sand and gravel material. Onsite investigation is needed on each individual site.

These pits are generally poorly suited to pasture, cultivated crops, and woodland use because of the low available water capacity and the high content of small stones. Generally, the potential is poor for habitat for wildlife, although some birds nest in these areas.

This map unit is not assigned to a capability subclass.

Ph—Pits, quarry. This map unit consists of excavations for extracting graphite, garnet, and limestone. The mined areas generally consist of cliff-like walls 10 to more than 100 feet high and pit floors 25 to several hundred feet long. Stones, boulders, and rubble in piles are commonly scattered on pit floors. Included in mapping, in some pits, are small pools of water. The excavations are generally irregular in shape and range from 2 to 20 acres.

These pits are generally bare of vegetation, although some of the older ones have scattered areas of brush, grass, and some trees. Areas of soil material in the pits are generally low in water available for plant growth. Permeability, or the rate of water movement through soil, differs from place to place. But generally, it is very rapid through the bedrock on the pit floors and in the piles of soil material and rock rubble scattered on the pit floors.

The potential of these areas for urban and recreation uses is limited. If these areas are used for sanitary waste disposal systems, ground water contamination is a hazard because of poor filtering of effluent. Onsite investigation is needed on each individual site for any intended use.

These pits are poorly suited to cultivated crops, pasture, and woodland use because of the high content of rock rubble, droughtiness and rock outcrops. Generally, potential is poor for use as habitat for wildlife. Some of the waste material from mined areas is a good source of roadfill and other fill material.

This map unit has not been assigned to a capability subclass.

PlA—Plainfield loamy sand, 0 to 3 percent slopes. This is a nearly level, deep, excessively drained soil on lowland plains and on terraces along valley floors. Areas of this soil are broad and oval and range from 3 to 30 acres.

Typically, the surface layer is very dark grayish brown loamy sand about 10 inches thick. The subsoil is yellowish brown and light olive brown sand about 15 inches thick. The substratum is light brownish gray sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Elnora and Hinckley soils. Also included are a few small areas of Tioga soils where Plainfield soils are adjacent to large streams. Also included, in the northern part of the survey area and at higher elevations, are areas of soils that are similar to this Plainfield soil but that have a more reddish color throughout. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Plainfield soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of more than 60 inches. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and rapid in the subsoil and the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is low or very low. The soil generally does not have gravel, but some layers are as much as 15 percent gravel, by volume. The surface layer is strongly acid to neutral.

Most areas of this soil have been cleared, but many areas are reverting to brush and forest. Some areas are used for urban development.

This soil is suited to many recreation and urban uses. The sandy texture and droughtiness are limitations to establishing and maintaining lawns or sod cover for golf courses and playgrounds. If the soils are used for septic tank absorption fields, ground water contamination is a hazard because of poor filtering of effluent. Ponds and habitat for wetland wildlife are difficult to establish because of seepage and the depth to the water table. The soil is generally a source of sand and roadfill.

Potential productivity for trees on this soil is moderately high. The sandy texture and droughtiness cause a high seedling mortality and somewhat limit tree growth. White pine, red pine, and oaks are common on this soil.

This soil is moderately suited to cultivated crops because of low natural fertility and droughtiness. Permanent sod crops or cover crops help to increase organic matter content, to improve soil tilth, and to increase the water-holding capacity of the soil. Irrigation helps to produce optimum yields.

This soil is in capability subclass IVs.

PlB—Plainfield loamy sand, 3 to 8 percent slopes. This is a gently sloping, deep, excessively drained soil on lowland plains and on terraces in valleys. Areas of the soil are broad and oval and range from 5 to 30 acres.

Typically, the surface layer is very dark grayish brown loamy sand about 10 inches thick. The subsoil is yellowish brown and light olive brown sand about 15 inches thick. The substratum is light brownish gray sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Elnora and Hinckley soils. Also included are a few small areas of Tioga soils where this Plainfield soil is adjacent to large streams. Also included, in the northern part of the survey area and at high elevations, are areas of soils that are similar to this Plainfield soil but that are reddish

throughout. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Plainfield soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of more than 60 inches. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and rapid in the subsoil and the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is low or very low. The soil generally does not have gravel, but some layers are as much as 15 percent gravel, by volume. The surface layer is strongly acid to neutral.

Most areas of this soil that had been cleared are now reverting to brush and forest. Some areas are used for urban development.

This soil is suited to many recreation and urban uses. The sandy texture and droughtiness limit the establishment and maintainance of lawns and grass cover for golf courses and playground areas. Slope limits the use of irrigation on the soil.

If the soil is used for septic tank disposal systems and sanitary landfills, ground water contamination is a hazard because of poor filtering of effluent. Ponds and habitat for wetland wildlife are difficult to establish because of seepage and the depth of the water table. The soil is generally a source of sand and roadfill.

Potential productivity for trees on this soil is moderately high. The sandy texture and droughtiness cause a high rate of seedling mortality and somewhat limit tree growth. White pine, red pine, and oaks are common on this soil.

This soil is moderately suited to cultivated crops because of the low soil fertility and droughtiness. Permanent sod crops or cover crops help to increase the organic matter content, to improve soil tilth, and to increase the water-holding capacity of the soil.

This soil is in capability subclass IVs.

PlC—Plainfield loamy sand, 8 to 15 percent slopes. This is a sloping, deep, excessively drained soil on lowland plains and terraces in valleys that have a high sand content. Areas of the soil are broad and oval and range from 5 to 30 acres.

Typically, the surface layer is very dark grayish brown loamy sand about 10 inches thick. The subsoil is yellowish brown and light olive brown sand about 15 inches thick. The substratum is light brownish gray sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Elnora and Hinckley soils. Also included, in the northern part of the survey area and at high elevations, are areas of soils that are similar to this Plainfield soil but that are reddish throughout. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table of this Plainfield soil is at a depth of more than 6 feet. Bedrock is mainly at a depth of more than 60 inches. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and rapid in the subsoil and the substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is low or very low. The soil generally does not have gravel, but some layers are as much as 15 percent gravel, by volume. The surface layer is strongly acid to neutral.

Most areas of this soil are forested.

This soil is moderately suited to many recreation and urban uses. Slope, the sandy texture, and droughtiness are the main limitations to these uses. If the soil is used for septic tank absorption fields and sanitary landfills, ground water contamination is a hazard because of the permeability in the substratum. The soil is generally a source of sand and roadfill.

Potential productivity for trees on this soil is moderately high. Seedling mortality is high because of the sandy texture and droughtiness. Laying out logging roads and skid trails on the contour help to control erosion. Oaks, white pine, and birch are common on this soil.

This soil is not suited to cultivated crops because of low soil fertility, droughtiness, and slope. Permanent sod crops or cover crops help to increase organic matter content, to improve soil tilth, and to increase the water-holding capacity of the soil. In some areas the soil is suited to hay and early season pasture.

This soil is in capability subclass VIe.

PoE—Plainfield and Oakville soils, steep. This map unit consists of deep, excessively drained and well drained soils on side slopes of benches and terraces. The total acreage of the map unit is about 40 percent Plainfield soils, 35 percent Oakville soils, and 25 percent other soils. Most areas are long and narrow and range from 5 to 15 acres. Some areas of the map unit are Plainfield soils, some are Oakville soils, and some consist of both. Slope ranges from 15 to 35 percent. The Plainfield and Oakville soils were mapped together because, on steep slopes, they are similar in use and management.

Typically, the surface layer of the Plainfield soils is dark grayish brown loamy sand about 10 inches thick. The subsoil is yellowish brown and light olive brown sand about 15 inches thick. The substratum is light brownish gray sand to a depth of 60 inches or more.

Typically, the surface layer of the Oakville soils is dark brown loamy fine sand about 8 inches thick. The subsoil is yellowish brown and light olive brown sand about 19 inches thick. The substratum is light olive brown and dark grayish brown sand to a depth of 60 inches or more.

Included with these soils in mapping are large areas of Hinckley soils. Also included, in the northern part of the survey area and at high elevations, are areas of soils

that are reddish throughout. Areas of included soils are 1 to 3 acres.

The seasonal high water table in the Plainfield and Oakville soils is at a depth of more than 6 feet. Bedrock is generally at a depth of more than 60 inches. Permeability, or the rate of water movement in the Plainfield soils, is moderately rapid in the surface layer and rapid below. In the Oakville soils it is rapid throughout. Surface runoff is medium or rapid. The capacity of the Plainfield soils to store water available for plant growth is low or very low and that in the Oakville soils is low. Gravel makes up less than 15 percent of the Plainfield soils and less than 3 percent of the Oakville soils. The surface layer is strongly acid to neutral in both soils.

Most areas of the soils are forested.

These soils are poorly suited to most recreation and urban uses because of slope, droughtiness, and the sandy texture. If the soils are disturbed or excavated, in some areas they become unstable and cave or slough.

Potential productivity for trees on the Plainfield and Oakville soils is moderately high. Slope limits the use of equipment, and droughtiness causes high seedling mortality. Oaks, white pine, and birch are common on these soils.

These soils are not suited to cultivated crops because of slope, droughtiness, and low soil fertility. Maintaining a vegetative cover helps to control both wind and water erosion. In some areas the soils are suited to early season pasture. However, reseeding and applying lime and fertilizer are difficult because of slope.

These soils are in capability subclass VIIe.

Ra—Raynham silt loam. This is a level to nearly level, deep, poorly drained soil on lowland plains and on benches or terraces in valleys. Most areas of the soil are oval to long and narrow and range from 3 to 20 acres.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is silt loam about 17 inches thick. In the upper part it is mottled and light yellowish brown, and in the lower part it is mottled and grayish brown. The substratum is mottled, brown very fine sandy loam to a depth of 35 inches and silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hartland and Belgrade soils on knolls and in convex areas. Also included are many areas of somewhat poorly drained soils and a few small areas of sandy Wareham soils and clayey Rhinebeck soils. Areas of the included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Raynham soil is at a depth of 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer, moderate or moderately slow in the subsoil, and slow in the substratum. Surface runoff is slow or very slow. The capacity of the soil to store water available for plant growth is high. Rock fragments make up 0 to 2 percent of the soil. The surface layer is strongly acid to neutral.

Most areas of this soil are forested. Some areas have been cleared and are used for farming.

This soil is poorly suited to most recreation and urban uses. The main limitation is the seasonal high water table. Permeability in the substratum is a limitation for septic tank absorption fields. Frost action potential is a limitation for local roads and streets. Some areas have suitable sites for ponds and habitat for wetland wildlife, but cutbanks and dikes tend to erode and slough.

Potential productivity for trees on this soil is moderate. The seasonal high water table causes a high rate of seedling mortality, limits the growth of older trees, and results in a shallow root zone which can lead to a windthrow hazard. The seasonal high water table also limits the use of equipment for harvesting timber and planting seedlings. White pine, yellow birch, and red maple are common on the soil.

This soil is moderately suited to pasture and hay. If drained, it is well suited to corn and other row crops. If the soil is used for pasture, restricted grazing in spring and other wet periods helps to prevent surface compaction and loss of desirable seedlings.

This soil is in capability subclass IVw.

RhA—Rhinebeck silt loam, 0 to 3 percent slopes. This is a nearly level, deep, somewhat poorly drained soil on lowland plains. Most areas of the soil are oval and range from 5 to 30 acres.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is mottled and about 20 inches thick. In the upper part it is brown silty clay loam, and in the lower part it is grayish brown silty clay. The substratum is mottled, dark gray silty clay loam and varved silt and clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hudson soils on knolls and Madalin soils in depressions. Also included are small areas of Hartland, Belgrade, and Raynham soils that have a high silt content and sandy Wareham soils. The included areas are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Rhinebeck soil is at a depth of 1/2 to 1 1/2 feet in spring. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately slow in the surface layer and slow in the subsoil and the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is high. This soil generally does not have gravel or stones. The surface layer is strongly acid to neutral.

Most areas of this soil are idle and are reverting to woodland. Some areas have been drained and are used for farming.

This soil is poorly suited to many recreation and urban uses. The seasonal high water table is a limitation for campgrounds, picnic areas, and homesites. Low strength and high frost action potential of the soil are limitations for local roads and streets. Using a coarser grained subgrade or base material to frost depth helps to prevent the damaged pavement caused by these limitations. Low strength and frost action potential in some areas also cause shifting and cracking of footings and foundations. Permeability is a limitation for septic tank absorption fields. Dug ponds and habitat for wetland wildlife are difficult to develop because of permeability of the soil and the slow rate of pond refill.

Potential productivity for trees on this soil is moderately high. The seasonal high water table in spring limits the use of equipment for planting seedlings and harvesting timber. Red maple, white pine, and hemlock are common on this soil.

In drained areas this soil is suited to some cultivated crops. Undrained, it is suited to hay and pasture. Restricted grazing and restricted use of equipment in spring and during wet periods help to prevent surface compaction and surface crusting. Cultivation at proper moisture levels, crop residue mixed into the soil, and cover crops help to prevent crusting and clodding of the surface layer, to increase organic matter content, and to maintain soil tilth.

This soil is in capability subclass IIIw.

RhB—Rhinebeck silt loam, 3 to 8 percent slopes. This is a gently sloping, deep, somewhat poorly drained soil on undulating, lowland plains. Most areas of the soil are oval and range from 5 to 40 acres.

Typically, the surface layer is very dark grayish brown silt loam about 8 inches thick. The subsoil is mottled and about 20 inches thick. In the upper part it is brown silty clay loam, and in the lower part it is grayish brown silty clay. The substratum is mottled, dark gray silty clay loam and varved silt and clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Hudson soils on high knolls and Madalin soils in depressions and along drainageways. Also included are small areas of Hartland, Belgrade, and Raynham soils that have a lower clay content than this Rhinebeck soil. Areas of included soils are 1 to 3 acres and make up 15 percent of the map unit.

The seasonal high water table in this Rhinebeck soil is at a depth of 1/2 to 1 1/2 feet. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately slow in the surface layer and slow in the subsoil and the substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is high. This soil generally has no gravel and stones. In unlimed areas the surface layer is strongly acid to neutral.

Most areas of this soil are idle and reverting to woodland. A few areas are used for farming.

This soil is poorly suited to most recreation and urban uses. The seasonal high water table is a limitation for campsites, picnic areas, and homesites. Low strength and high frost action potential of the soil are limitations for road and streets and in some areas cause shifting and cracking of footings and foundations. Permeability is a limitation for septic tank absorption fields. Dug ponds and habitat for wetland wildlife are somewhat difficult to develop because of slope and the slow rate of pond refill.

Potential productivity for trees on this soil is moderately high. The seasonal high water table in spring limits the use of equipment for planting seedlings and harvesting timber. Red maple, white pine, and hemlock are common on this soil.

In drained areas this soil is suited to some cultivated crops. If undrained it is suited to hay and pasture. Restricted use of equipment and restricted grazing in spring and during wet periods help to prevent surface compaction and surface crusting. If the soil is intensively cropped, erosion is a serious hazard. Cultivation at proper moisture levels, conservation tillage systems that return crop residue to the soil, contour farming, and cover crops help to control erosion, to increase organic matter content, to maintain soil tilth, and to prevent surface crusting and clodding.

This soil is in capability subclass IIIw.

Ro—Rock outcrop. This map unit consists of large areas of rock outcrops on landscapes that range from nearly level mountaintops to very steep mountainsides and hillsides on uplands. It is about 90 percent areas of rock outcrops and 10 percent soils. Some places have nearly vertical ledges and cliffs, and thus the surface configuration commonly differs within short distances. Slope ranges from 0 to 65 percent. Individual areas range from oval to long and narrow and range from 10 to nearly 100 acres.

Included with this unit in mapping are areas of shallow Woodstock and Lyman soils and areas of soils that are less than 10 inches deep. Also included, in places, are areas of deep Hermon, Marlow, Stowe, and Bice soils. Some areas have many stones and boulders on the surface. The included areas are 1 to 3 acres and generally make up as much as 10 percent of the map unit. They make up as much as 30 percent of a few map units.

Vegetation in areas of Rock outcrop is very sparce. Some woody plants of very low quality grow in scattered areas where soil material in small amounts has accumulated and where cracks or crevices in rocks have moisture and nutrients.

Areas of Rock outcrop are not suited to most types of recreation uses or to community development, woodland use, and farming because of the lack of soil cover. Some areas make up parts of ski slopes or are crossed by hiking trails.

This map unit is in capability subclass VIIIs.

Sa—Saprists and Aquepts, inundated. This map unit consists of very poorly drained organic and mineral soils in level areas or depressions commonly bordering streams, lakes, ponds, and other open bodies of water. Some areas are mostly Saprists, some are mostly Aquepts, and some consist of both soils. The total acreage of the map unit is about 60 percent Saprists, 30 percent Aquepts, and 10 percent other soils. These areas are commonly called freshwater marsh. Most areas are oblong and range from 3 to 50 acres. Slope is less than 1 percent. Saprists and Aquepts were mapped together because they are similar in use and management.

The uppermost layer of Saprists is black, decomposed, organic material more than 16 inches thick. The underlying layers range from silty clay to gravelly loamy sand.

The surface layer of Aquepts is thin, black or gray organic material. The underlying layers are mottled, gray to brown fine sandy loam or sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are areas of poorly drained and very poorly drained, mineral soils on the slightly higher parts of the landscape. Also included are Palms, Carlisle, Cathro, and Greenwood mucks. The included areas are 1 to 10 acres.

Most areas of these soils are covered with cattails, rushes, grasses, and other marsh vegetation.

These soils are not suited to most recreation and urban uses, woodland use, or farming. The seasonal high water table, flooding or ponding, and excess humus are limitations to these uses. Areas of these soils have suitable sites for ponds, and are well suited to use as habitat for wetland wildlife (fig. 6).

These soils are in capability subclass VIIIw.

ScA—Schroon gravelly fine sandy loam, 0 to 3 percent slopes. This is a nearly level, deep, moderately well drained soil on foot slopes and in shallow depressions on uplands. Most areas of the soil are long and broad and range from 5 to 50 acres.

Typically, the surface layer is covered with a thin leaf duff. The surface layer is very dark gray gravelly fine sandy loam about 4 inches thick. The subsoil is gravelly fine sandy loam about 21 inches thick. In the upper part it is dark brown and brown, and in the lower part it is mottled and yellowish brown. The substratum is mottled, olive gravelly coarse sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Bice soils on knolls and Lyme soils along drainageways and in depressions. Also included are areas of Stowe soils, which have a firm, dense substratum, and a few areas of soils that have stones on the surface. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Schroon soil is at a depth of 1 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate. Surface runoff is slow. The capacity of the soil to store water available for plant growth is moderate. Small rock fragments make up 15 to 30 percent, by volume, of the surface layer. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil are forested. Some areas have been cleared and are used for farming.

This soil is moderately suited to many recreation uses and some urban uses. The seasonal high water table is the main limitation to such uses, particularly for dwellings with basements and septic tank absorption fields. Potential frost action is a limitation for local roads and streets. Ponds and habitat for wetland wildlife are somewhat difficult to develop because of the depth to the water table and, in some areas, seepage caused by the permeability of this soil.

Potential productivity for trees on this soil is moderate. In some areas the seasonal high water table somewhat restricts the root zone. There are few limitations to woodland management. Sugar maple and red oak are common on this soil.

This soil is well suited to cultivated crops. The main limitation is the short growing season because of high elevations. If the included areas of wet soils are drained, in areas cleared of stones the soil is suited to short-season row crops. In cultivated areas cover crops and conservation tillage systems that return crop residue to the soil helps to maintain soil tilth and to improve the water-holding capacity of the soil. Many areas are better suited to pasture than row crops.

This soil is in capability subclass IIw.

ScB—Schroon gravelly fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, moderately well drained soil on foot slopes in upland areas. Most areas of the soil are long and broad and range from 5 to 50 acres.

Typically, the surface layer is covered with a thin leaf duff. The surface layer is very dark gray gravelly fine sandy loam about 4 inches thick. The subsoil is gravelly fine sandy loam about 21 inches thick. In the upper part it is dark brown and brown, and in the lower part it is mottled and yellowish brown. The substratum is mottled, olive gravelly coarse sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Bice soils on knolls and Lyme soils along drainageways. Also included are areas of Stowe soils, which have a firm, dense substratum, and a few areas of soils that have stones on the surface. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

Figure 6.—An area of Saprists and Aquepts, inundated, in the foreground. These soils are suited to use as habitat for wetland wildlife. An area of Bice-Woodstock very bouldery fine sandy loams, steep, in the background. Most areas of these soils are woodland. (Photo courtesy of Alan Cederstrom)

The seasonal high water table in this Schroon soil is at a depth of 1 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is moderate. Small rock fragments make up 15 to 30 percent of the surface layer. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil are forested. Some areas have been cleared and are used for farming.

This soil is suited to many recreation uses and some urban uses. The main limitation is the seasonal high water table, particularly for dwellings with basements and septic tank absorption fields. Potential frost action is a limitation for local roads and streets. Ponds and habitat for wetland wildlife are difficult to develop because of the depth to the water table, slope, and, in some areas, seepage caused by the permeability of the soil.

Potential productivity for trees on this soil is moderate. There are few limitations to woodland management. In some areas the seasonal high water table limits the use of equipment in spring and somewhat restricts root growth. Sugar maple and red oak are common on this soil.

This soil is well suited to cultivated crops but the growing season is short. If the included areas of wet soils are drained, in areas cleared of occasional stones the soil is suited to short-season varieties of corn and to hay. In cultivated areas conservation tillage, contour farming, and cover crops help to control erosion.

This soil is in capability subclass IIw.

SdB—Schroon very bouldery fine sandy loam, gently sloping. This is a deep, moderately well drained soil in depressions, on foot slopes, and in undulating areas on uplands. Boulders 5 to 30 feet apart are on the surface. Most areas of the soil are oblong and from 10 to 25 acres. Slope ranges from 3 to 15 percent.

Typically, the surface layer is covered with a thin leaf duff. The surface layer is very dark gray gravelly fine sandy loam about 4 inches thick. The subsoil is gravelly fine sandy loam about 21 inches thick. In the upper part it is dark brown, and in the lower part it is yellowish brown and mottled. The substratum is mottled, olive gravelly coarse sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are areas of Bice soils on knolls and Lyme soils along drainageways. Also included are some areas of soils that are similar to this Schroon soil but are somewhat poorly drained. Also included are some areas of Stowe, Marlow, and Peru soils, which have a firm, dense layer in the substratum. Areas of included soils are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Schroon soil is at a depth of 1 1/2 to 2 feet. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is moderate. Small rock fragments make up 15 to 30 percent of the surface layer. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil are forested. Some areas that had been cleared for farming have reverted to brush and forest.

This soil is moderately suited to many recreation uses and some urban uses. The main limitations to these uses are the seasonal high water table, large stones on the surface, and, in some places, slope. Potential frost action is a hazard for local roads and streets. Ponds and habitat for wetland wildlife are difficult to develop because of slope, depth to the water table, and, in some areas, seepage caused by the permeability of the soil.

Potential productivity for trees on this soil is moderate. In most areas large stones on the surface and the seasonal high water table in spring limit the use of equipment for planting seedlings and harvesting timber. White pine, sugar maple, and red oak are common on this soil.

This soil is not suited to cultivated crops because of boulders on the surface and the seasonal high water table in spring. In some areas it is suited to pasture, but restricted grazing in spring when the soil is wet helps to prevent surface compaction and to maintain the desirable forage grasses.

This soil is in capability subclass VIs.

Sh—Shaker fine sandy loam. This is a nearly level, deep, poorly drained soil in flat areas or in slight depressions on lowland plains. Slope ranges from 0 to 3 percent. Most areas of the soil are oval or oblong and range from 3 to 10 acres, but a few areas are as much as 20 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is mottled, grayish brown fine sandy loam and sandy loam about 26 inches thick. The substratum is mottled, gray silty clay to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Elmridge soils on knolls and ridges and Raynham soils, which have a high silt content. Also included are areas of soils that are similar to this Shaker soil but are somewhat poorly drained and areas of soils that have a mucky surface layer. Areas of the included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Shaker soil is at or near the surface in winter and spring. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderately rapid in the surface layer and the subsoil and slow or very slow in the clayey substratum. Surface runoff is slow. The capacity of the soil to store water

available for plant growth is high. Rock fragments are generally not in the soil, but in some areas make up as much as 3 percent throughout. The surface layer is strongly acid to neutral.

Most areas of this soil are forested. Some areas have been cleared and are used for farming.

This soil is not suited to most recreation and urban uses because of the seasonal high water table and permeability in the substratum. Low strength because of the high clay content in the substratum and potential frost action are limitations for local roads and streets. Most areas of the soil are suitable for ponds and habitat for wetland wildlife. However, pond refill is slow in most areas.

Potential productivity for trees on this soil is low. The seasonal high water table restricts root growth and thus causes a hazard of windthrow, lowers the rate of seedling survival, and limits the use of equipment for planting seedlings and harvesting timber. Red maple, white spruce, and yellow birch are common on this soil.

This soil is moderately suited to cultivated crops. If drained, it is suited to row crops and hay. Suitable outlets for drainage are difficult to find because of the low position of the soil on the landscape. Undrained, the soil is suited to pasture during dry periods of the year. In pasture management, restricted grazing in spring when the soil is wet helps to prevent surface compaction and the loss of desirable pasture grasses.

This soil is in capability subclass IVw.

SoB—Stowe fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, well drained and moderately well drained soil on smooth hilltops on uplands. Most areas are oblong and range from 5 to 75 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is about 22 inches thick. In the upper 15 inches it is yellowish brown and light olive brown fine sandy loam. In the lower 7 inches it is grayish brown fine sandy loam. The substratum is a firm, dense layer of dark grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat poorly drained soils that have a dense substratum. Also included are small areas of Lyme soils in depressions and areas of Bice soils on knolls, both of which do not have a firm, dense substratum, and small areas of Woodstock soils, which are less than 20 inches deep to bedrock. Also included, in the northern part of the survey area, are some areas of soils that are similar to this Stowe soil but are sandier and reddish throughout. Also included are small areas of rock outcrop and areas of soils where a few stones are scattered on the surface. The included areas are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Stowe soil is perched above the firm, dense substratum at a depth of 1 1/2 to 2 1/2 feet for brief periods in spring and winter. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid in the surface layer and the subsoil and slow in the firm, dense substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. The surface layer is strongly acid to neutral.

Most areas of this soil are forested or are covered with mixed brush and young trees. A few areas are used for farming.

This soil is suited to many recreation uses and a few urban uses. The seasonal high water table is a limitation for campgrounds, picnic areas, and dwellings with basements. Permeability in the substratum and the seasonal high water table are limitations for septic tank absorption fields. Potential frost action is a limitation for local roads and streets.

Potential productivity for trees on this soil is moderately high. There are few or no limitations to woodland management. Sugar maple, hemlock, and white pine are common on this soil.

This soil is well suited to most cultivated crops grown in the region, but the growing season is short. Small stones somewhat limit the use of tillage equipment. Erosion is a hazard in areas unprotected by plant cover or intensively cropped. Cover crops or sod crops and conservation tillage systems that return crop residue to the soil help to control erosion, to increase organic matter content, and to maintain soil tilth. Crops and pasture respond well to lime and fertilizer if soil moisture is adequate. In some years the soil is droughty.

This soil is in capability subclass IIe.

SoC—Stowe fine sandy loam, 8 to 15 percent slopes. This is a sloping, deep, well drained and moderately well drained soil on hillsides on uplands. Most areas of the soil are oblong and range from 5 to 75 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is about 22 inches thick. In the upper 15 inches it is yellowish brown and light olive brown fine sandy loam. In the lower 7 inches it is grayish brown sandy loam. The substratum is a firm, dense layer of dark grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Bice soils, which do not have a firm, dense substratum, and Woodstock soils, which are less than 20 inches deep to bedrock. Also included, in places, are areas of Lyme soils in depressions and along drainageways. Also included, in the northern part of the survey area, are some areas of soils that are similar to this Stowe soil but are sandier and are reddish throughout. Also included are small areas of rock outcrop and areas of soils where

a few stones are on the surface. Areas of the included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Stowe soil is perched above the firm, dense substratum at a depth of 1 1/2 to 2 1/2 feet for brief periods in spring and winter. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid in the surface layer and the subsoil and slow in the substratum. Surface runoff is slow or medium. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. The surface layer is strongly acid to neutral.

Most areas of this soil are forested or are covered with mixed brush and young trees. A few areas are used for farming.

This soil is moderately suited to some recreation uses and a few urban uses. The seasonal high water table and slope are limitations for picnic areas, camp grounds, and homesites. Permeability in the substratum is a limitation for septic tank absorption fields. Ponds and habitat for wetland wildlife are difficult to develop because of slope, seepage, and, commonly, a lack of water.

Potential productivity for trees on this soil is moderately high. Laying out logging trails on the contour help to control gullying on the trails. Sugar maple, helmock, and white pine are common on this soil.

This soil is suited to hay, forage crops, and pasture. It is also suited to row crops, but the growing season is short. Erosion is a hazard in areas unprotectd by plant cover or cropped intensively. Sod crops, contour farming, and conservation tillage systems that return crop residue to the soil help to control erosion and to maintain soil tilth.

This soil is in capability subclass IIIe.

SoD—Stowe fine sandy loam, 15 to 25 percent slopes. This is a moderately steep, deep, well drained and moderately well drained soil on hillsides on uplands. Most areas of the soil are oblong and range from 5 to 75 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is about 22 inches thick. In the upper 15 inches it is yellowish brown and light olive brown fine sandy loam. In the lower 7 inches it is grayish brown fine sandy loam. The substratum is a firm, dense layer of dark grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Schroon and Bice soils, which do not have a firm, dense substratum, and Woodstock soils, which are less than 20 inches deep over bedrock. Also included are small areas of rock outcrop and areas of soils where a few large stones are on the surface. Areas of the included soils are 1 to 3 acres and make up 10 percent of the map unit.

The seasonal high water table in this Stowe soil is perched above the firm, dense substratum at a depth of 1 1/2 to 2 1/2 feet for brief periods in spring and winter. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid in the surface layer and the subsoil and slow in the substratum. Surface runoff is medium to rapid. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. The surface layer is strongly acid to neutral.

Most areas of this soil are forested or are covered with mixed brush and young trees. A few areas are used for pasture.

The soil is poorly suited to most recreation and urban uses because of slope. The seasonal high water table in spring is a limitation for homesites, septic tank absorption fields, campgrounds, and picnic areas. Permeability in the substratum is also a limitation for septic tank absorption fields. In most areas slope is a limitation for ponds.

Potential productivity for trees on this soil is moderately high. Erosion is a hazard, and slope somewhat limits the use of equipment. Laying out skid trails and logging roads on the contour help to control erosion on trails. Sugar maple, hemlock, and white pine are common on this soil.

This soil is moderately suited to pasture or hay. Sod crops help to control erosion. Slope limits the use of equipment.

This soil is in capability subclass IVe.

StC—Stowe very bouldery fine sandy loam, sloping. This is a gently sloping and sloping, deep, well drained and moderately well drained soil on hillsides and hillcrests on uplands. Stones and boulders about 5 to 30 feet apart are on the surface. Most areas of the soil are oblong and range from 10 to more than 50 acres. Slope ranges from 3 to 15 percent, but is dominantly 5 to 12 percent.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is about 22 inches thick. In the upper 15 inches it is yellowish brown and light olive brown fine sandy loam. In the lower 7 inches it is grayish brown sandy loam. The substratum is a firm, dense layer, of dark grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat poorly drained soils that have a dense substratum and that are in depressions and along drainageways. Also included are areas of Bice and Lyme soils, which do not have a firm, dense substratum, and Woodstock soils, which are less than 20 inches deep to bedrock. Also included, in the northern part of the survey

area, are some areas of soils that are similar to this Stowe soil but are sandier and reddish. Also included are scattered areas of rock outcrop. Also included are areas of soils where fewer or more boulders are on the surface than on this soil. Areas of included soils are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Stowe soil is perched above the firm, dense substratum at a depth of 1 1/2 to 2 1/2 feet for brief periods in spring and winter. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid in the surface layer and the subsoil and slow in the substratum. Surface runoff is medium or slow. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. The surface layer is strongly acid to neutral.

Most areas of this soil are forested. Areas of pasture that had been cleared of trees have reverted to forest.

This soil is suited to most recreation uses, such as camp areas and paths and trails. The main limitations are slope, large stones on the surface, and the seasonal high water table in spring. This soil commonly has suitable sites for some types of ponds, but in some areas slope is a limitation. The soil is generally poorly suited to urban uses. Permeability in the substratum is a limitation for septic tank absorption fields. The seasonal high water table is a limitation for homesites. Large stones on the surface and potential frost action are also limitations for urban uses.

Potential productivity for trees on this soil is moderately high. There are few limitations to woodland management, but in some areas large stones on the surface slightly limits the use of equipment. Sugar maple, hemlock, and white pine are common on this soil.

This soil is not suited to cultivated crops because stones and boulders on the surface limit the use of equipment. In some areas the soil is suited to pasture, but boulders on the surface limit reseeding and applying lime and fertilizer.

This soil is in capability subclass VIs.

StE—Stowe very bouldery fine sandy loam, steep. This is a moderately steep and steep, deep, well drained and moderately well drained soil on hillsides and valley sides on uplands. Stones and boulders about 5 to 30 feet apart are on the surface. Most areas of the soil are oblong and range from 10 to more than 75 acres. Slope ranges from 15 to 45 percent but are dominantly 25 to 35 percent.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is about 22 inches thick. In the upper part it is brown and light olive brown fine sandy loam. In the lower 7 inches it is leached grayish brown sandy loam. The substratum is a firm, dense layer of dark grayish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat poorly drained soils in slight depressions and along drainageways. Also included are areas of Bice soils, which do not have a firm, dense substratum, and Woodstock soils, which are less than 20 inches deep to bedrock. Also included, in the northern part of the survey area, are some areas of soils that are similar to this Stowe soil but are sandier and are reddish throughout. Also included are scattered areas of rock outcrop and areas of soils where fewer or more boulders are on the surface than on that of this soil. Areas of included soils are as much as 10 acres and make up about 30 percent of the map unit.

The seasonal high water table in this Stowe soil is perched above the firm dense substratum at a depth of 1 1/2 to 2 1/2 feet for brief periods in spring and winter. Bedrock is generally at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid in the surface layer and the subsoil and slow in the substratum. Surface runoff is medium or rapid. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent, by volume, of the surface layer and 5 to 25 percent of the subsoil. The surface layer is strongly acid to neutral.

Most areas of this soil are forested. A few areas are used for recreation, such as hiking trails and ski slopes.

The soil is poorly suited to most recreation and urban uses because of slope, large boulders on the surface, the seasonal high water table in spring, and permeability in the substratum. Some areas are suited to hiking paths and trails.

Potential productivity for trees on this soil is moderately high. Slope and the boulders on the surface limit the use of equipment. Proper design and construction of logging roads and skid trails help to control erosion on trails. Sugar maple, hemlock, and white pine are common on this soil.

This soil is not suited to cultivated crops because of slope and boulders on the surface. Some small areas are suited to pasture, but reseeding and applying fertilizer are very difficult.

This soil is in capability subclass VIIs.

SuB—Sutton fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, deep, moderately well drained soil on foot slopes and in shallow depressions on uplands. Most areas of the soil are long and broad and range from 5 to 50 acres.

Typically, the surface layer is covered with a thin, decomposed leaf litter. The surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The subsoil is fine sandy loam about 24 inches thick. In the upper part it is dark yellowish brown, and in the lower part it is mottled and yellowish brown. The substratum is

mottled, olive fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Charlton and Massena soils. Also included are Paxton and Woodbridge soils, which have a firm, dense substratum. Also included are areas of nearly level Sutton soils and a few areas of soils where stones are on the surface. Areas of the included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Sutton soil is at a depth of 1 1/2 to 3 feet. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid. Surface runoff is slow. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 20 percent of the subsoil. In unlimed areas the surface layer is very strongly acid to moderately acid.

Most areas of this soil are forested. Some areas have been cleared of trees and stones and are used for farming.

This soil is suited to some recreation and urban uses. The main limitation is the seasonal high water table. Slope is a limitation for playground use. The seasonal high water table is a limitation for dwellings with basements and septic tank absorption fields. Seepage is a limitation for sanitary landfills and other waste disposal systems. Ponds and habitat for wetland wildlife are difficult to develop because of slope, seepage, and the depth to the water table in the drier periods in summer.

Potential productivity for trees on this soil is moderate. There are few limitations to woodland management, but the seasonal high water table somewhat restricts root growth. White pine, birch, beech, and oaks are common on this soil.

This soil is well suited to cultivated crops. If the included wet spots are drained, in areas cleared of occasional surface stones the soil is suited to corn and hay. Contour farming, cover crops, and conservation tillage systems that return most of the crop residue to the soil surface help to maintain soil tilth, to increase the water-holding capacity, and to control erosion. The soil is suited to pasture, but restricted grazing in spring when the soil is moist helps to prevent surface compaction and loss of the desirable forage grasses.

This soil is in capability subclass IIw.

To—Tioga fine sandy loam. This is a nearly level, deep, well drained soil on flood plains along major streams. Slope ranges from 0 to 3 percent. Most areas of the soil are oblong in shape and range from 1 to 10 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam about 10 inches thick. The subsoil is dark grayish brown, dark brown, brown, and dark yellowish brown fine sandy loam about 18 inches thick. The substratum is yellowish brown fine sandy loam to a depth of 41 inches and loose, dark yellowish brown loamy sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Middlebury soils in low-lying areas and areas of Fluvaquents and Udifluvents immediately adjacent to streams. Also included, on small terraces above the flood plain, are areas of sandy Oakville and Plainfield soils and gravelly Hinckley and Belgrade soils, which have a high silt content. Some units are where the surface layer of this Tioga soil has been removed for use as topsoil. Also included, in the northern part of the survey area, are areas of soils that are similar to this Tioga soil but have colder soil temperatures. Areas of included soils are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table in this Tioga soil is at a depth of 3 to 6 feet. The soil is occasionally flooded for brief periods in early spring or in midwinter. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate or moderately rapid in the surface layer and the subsoil and moderate to rapid in the substratum. Surface runoff is slow. The capacity of the soil to store water available for plant growth is high. The surface layer is strongly acid to neutral.

Most areas of this soil have been cleared and are used for farming (fig. 7). A few areas are in recreation use.

This soil is suited to some recreation uses, such as picnic areas, and paths and trails, but permanent structures at campsites or on playgrounds are not feasible because of the flood hazard. This soil is poorly suited to most urban uses because of flooding and the seasonal high water table. Ponds and habitat for wetland wildlife are difficult to develop because of seepage and piping of the soil material in embankments and dikes.

Potential productivity for trees on this soil is high. There are a few limitations to woodland management. Sugar maple, red oak, and white pine are common trees on this soil.

This soil is well suited to cultivated crops. It is suited to most crops grown in the region, but the crop varieties are restricted at high elevations because of the relatively short growing season. In some areas streambank erosion is a hazard and the surface can be scoured during flooding. Cover crops, sod crops in the cropping system, and conservation tillage systems that return crop residue to the soil help to control surface scour or erosion, to increase organic matter content, and to maintain soil tilth.

This soil is in capability class I.

Ud—Udorthents, smoothed. This map unit consists of areas that were excavated or filled with material derived from sandy, gravelly, or loamy soils. The material from most areas that were excavated was used as roadfill in the construction of the Adirondack Northway.

Figure 7.—Typical area of nearly level Tioga fine sandy loam on a flood plain adjacent to a stream. This soil is well suited to cultivated crops. (Photo courtesy of Alan Cederstrom)

Other areas consist of filled or leveled areas used for parking lots, for recreation areas, as sanitary landfills, and for other similar uses. These areas have small pits that were the source for this fill material. Areas of this map unit differ in shape and are 1 to 10 acres. Slope ranges from 0 to 15 percent.

Many areas of Udorthents, smoothed, have been covered with topsoil and seeded. Other areas have been smoothed, graded, and left bare. Some areas are droughty because available water capacity, or the capacity to store water for plant use, is very low. Permeability, or the rate of water movement through the soil, ranges from moderate to very rapid. Topsoil and fertilizer are needed to establish a plant cover in bare areas.

The potential for urban development and recreation uses differs from area to area of this map unit. Onsite investigation is needed for each individual site.

This map unit generally is poorly suited to farming and to use as woodland and as habitat for wildlife.

This map unit is not assigned to a capability subclass.

Wa—Wareham loamy sand. This is a nearly level, deep, and somewhat poorly drained or poorly drained soil in depressions on sandy plains and on low benches in valleys. Slope ranges from 0 to 3 percent. Most areas of this soil are oval or long and narrow, and range from 3 to 20 acres. The mountainous areas of the soil are mostly 10 to 25 acres.

Typically, the surface layer is very dark grayish brown loamy sand about 8 inches thick. The subsoil is mottled, olive brown loamy fine sand about 10 inches thick. The substratum is mottled, gray loamy sand to a depth of 32 inches and olive sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Elnora soils on knolls. Also included, in the mountainous regions, are many large areas of soils that have a surface layer and a subsoil of fine sandy loam or sandy loam. Also included are areas of Raynham soils, which have a high silt content, and areas of similar soils, which are very poorly drained. Also included are a few small areas of loamy Massena soils and a few areas of soils that have a mucky surface layer. Areas of included soils

are 1 to 3 acres and make up about 15 percent of the map unit.

The seasonal high water table is between the surface and a depth of 1 1/2 feet most of the year. Bedrock is at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is rapid. Surface runoff is slow or very slow. The capacity of the soil to store water available for plant growth is moderate or low. Rock fragments make up 0 to 15 percent of the surface layer and the subsoil and 0 to 60 percent of the substratum. In unlimed areas the surface layer is extremely acid to slightly acid.

Most areas of this soil are forested or are idle pasture that is reverting to forest.

This soil is poorly suited to most recreation and urban uses because of the seasonal high water table. Cutbanks in excavations tend to cave. Ground water contamination is a hazard if this soil is used as a site for septic tank absorption fields because of poor filtering of effluent. Seepage is a limitation for sanitary landfills. Some areas are suitable for the development of ponds and habitat for wetland wildlife. Seepage and caving are limitations for dikes and embankments.

Potential productivity for trees on this soil is moderate. The seasonal high water table restricts root growth and thus causes a windthrow hazard and limits the use of equipment for planting seedlings and harvesting timber. Planting suitable, water-tolerant species helps to prevent windthrow. Red maple, red spruce, and hemlock are common on this soil.

This soil is moderately suited to cultivate crops. In undrained areas it is best suited to midsummer pasture. Suitable drainage outlets are commonly difficult to locate because of the low position of this soil on the landscape. If drained, it is suited to corn, other row crops, and hay. Because of the sandy texture of this soil, drained areas are generally easy to cultivate.

This soil is in capability subclass IVw.

WgB—Woodbridge fine sandy loam, 3 to 8 percent slopes. This is a deep, moderately well drained soil on gently sloping areas on uplands that receive runoff from higher, adjacent soils. Most areas of the soil are oblong and range from 5 to 15 acres, but areas are as large as 50 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsoil is yellowish brown and light olive brown fine sandy loam about 21 inches thick. It is mottled in the lower part. The substratum is very firm, mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of Paxton soils on knolls and Massena soils in depressions. Also included are small areas of nearly level Woodbridge soils. Areas of included soils are 1 to 3 acres and make up about 10 percent of the map unit.

The seasonal high water table in this Woodbridge soil is perched above the very firm, dense substratum at a depth of 1 1/2 to 2 1/2 feet in winter and early spring. Bedrock is mainly at a depth of 60 inches or more. Permeability, or the rate of water movement through the soil, is moderate in the surface layer and the subsoil and slow or very slow in the substratum. Surface runoff is medium. The capacity of the soil to store water available for plant growth is moderate. Rock fragments make up 5 to 30 percent of the surface layer and the subsoil. In unlimed areas the surface layer is very strongly acid to slightly acid.

Some areas of this soil are used for farming and are in urban use. Many areas are idle or used as woodland.

This soil is moderately suited to most recreation uses, but poorly suited to some urban uses. The seasonal high water table in spring, and permeability in the substratum are limitations for campgrounds and picnic areas. The seasonal high water table is a limitation for septic tank absorption fields and dwellings with basements. Potential frost action is a limitation for local roads and streets. Some areas have suitable sites for ponds and habitat for wetland wildlife, but in some areas slope and the variable depth to the water table in midsummer commonly are limitations.

Potential productivity for trees on this soil is moderately high. The perched seasonal high water table and the very firm substratum somewhat restrict root growth, and thus trees can be uprooted in windy periods. Red oak, sugar maple, hemlock, and white pine are common on this soil.

This soil is well suited to cultivated crops. In some areas it is suited to hay and pasture, and in a few areas it is suited to corn. However, the growing season is somewhat short. In some years the seasonal high water table in spring delays tillage. In some areas drainage of the included wet soils is needed to facilitate more uniform management of fields. Erosion is a hazard. Contour farming and conservation tillage systems that return crop residue to the surface help to control erosion.

This soil is in capability subclass IIw.

WoC—Woodstock-Rock outcrop complex, sloping. This map unit consists of shallow, somewhat excessively drained or excessively drained Woodstock soils and areas of Rock outcrop in bedrock-controlled areas on hillsides, hillcrests, and mountaintops. It is about 55 percent Woodstock soils, 20 percent areas of Rock outcrop, and 25 percent other soils. Areas of this soil and Rock outcrop are mostly oblong and 10 to several hundred acres. Stones and boulders 5 to 30 feet apart are on the surface. The Woodstock soil and areas of Rock outcrop are in such an intricate pattern on the landscape that they could not be separated at the scale selected for mapping. Slope ranges from 3 to 15 percent but is dominantly 8 to 15 percent.

Typically, the surface layer of the Woodstock soil is very dark grayish brown fine sandy loam about 2 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam about 16 inches thick. Granite bedrock is at a depth of 18 inches.

Rock outcrop consists of exposures, faces, and ledges of schist, gneiss, or granite bedrock.

Included with this unit in mapping are some large areas of shallow soils less than 10 inches deep. Also included, in places, are areas of the deep Bice, Stowe, Hermon, and Marlow soils. Also included are areas of Schroon, Peru, and Lyme soils in low areas and along drainageways and small areas of stone rubble accumulated at the base of many slopes. Areas of included soils are as much as 10 acres and make up 25 percent of the map unit.

A seasonal high water table does not occur in Woodstock soil above bedrock. Bedrock is at a depth of 10 to 20 inches. Permeability, or the rate of water movement through the soil, is moderately rapid. Surface runoff is medium on the Woodstock soil and rapid on rock outcrops. The capacity of the Woodstock soil to store water available for plant growth is low. Rock fragments make up 5 to 15 percent of the surface layer and 5 to 25 percent of the subsoil. The surface layer is strongly acid to slightly acid.

Most areas of the soil in this map unit are forested. Some areas, particularly where rock outcrops are dominant, are bare of plant cover.

This soil is poorly suited to most recreation and urban uses. Some areas have suitable sites for hiking paths and trails. Rock outcrops, shallow depth to bedrock, numerous stones and boulders on the surface, and droughtiness are limitations for most other uses.

Potential productivity for trees on this Woodstock soil, is moderate. Trees can be uprooted in windy periods because of the shallow rooting depth, and seedling mortality is high because of droughtiness. Rock outcrops limit the use of equipment. White pine and red pine are common on the Woodstock soil.

This Woodstock soil is not suited to cultivated crops. Shallow depth to bedrock, rock outcrops, and stones and boulders on the surface limit the use of equipment. Droughtiness restricts plant growth. In some areas the soil is suited to low quality, unimproved pasture.

This Woodstock soil is in capability subclass VIs.

WoE—Woodstock-Rock outcrop complex, steep. This map unit consists of shallow, somewhat excessively drained or excessively drained Woodstock soil and areas of Rock outcrop in bedrock-controlled areas on hillsides, hillcrests, and mountainsides. It is about 50 percent Woodstock soil, 30 percent areas of Rock outcrop, and 20 percent other soils. Areas of this soil and Rock outcrop are mostly long and narrow and 10 to several hundred acres. Stones and boulders 5 to 30 feet apart are on the surface. The Woodstock soil and areas of Rock outcrop are in such an intricate pattern on the landscape that they could not be separated at the scale selected for mapping. Slope ranges from 15 to 45 percent but is dominantly more than 20 percent.

Typically, the surface layer of the Woodstock soil is very dark grayish brown fine sandy loam about 2 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam about 16 inches thick. Granite bedrock is at a depth of 18 inches.

Rock outcrop consists of protrusions, faces, and ledges of schist, gneiss, or granite bedrock.

Included with this unit in mapping are some large areas of soils that are less than 10 inches deep over bedrock. Also included, in places, are areas of the deep Bice, Stowe, Hermon, and Marlow soils. Also included are areas of Schroon, Peru, and Lyme soils in low areas and along drainageways and small areas of stone rubble accumulated at the base of slopes. Areas of included soils are as much as 10 acres and make up 20 percent of the map unit.

A seasonal high water table does not occur in the Woodstock soil above bedrock. Bedrock is at a depth of 10 to 20 inches. Permeability, or the rate of water movement through the soil, is moderately rapid. Surface runoff is rapid on the Woodstock soil and very rapid on rock outcrops. The capacity of the Woodstock soil to store water available for plant growth is low. Rock fragments make up 5 to 15 percent, by volume, of the surface layer and 5 to 25 percent of the subsoil. The surface layer is strongly acid to slightly acid.

Most areas of the soil in this map unit are forested. Some areas, particularly where rock oucrops are dominant, are bare of plant cover.

This soil is poorly suited to most recreation and urban uses. Slope, rock outcrops, shallow soil depth, and large stones and boulders on the surface are limitations for these uses. Some areas are suited to improvement of habitat for woodland wildlife.

Potential productivity for trees on this Woodstock soil is moderate. Slope and rock outcrops limit the use of equipment. Trees can be uprooted during windy periods because of the shallow rooting depth, and seedling mortality is high because of droughtiness. White pine and red pine are common on the Woodstock soil.

This Woodstock soil is not suited to cultivated crops because of slope, rock outcrops, shallow depth to bedrock, and numerous stones and boulders on the surface. Slope, stones and boulders on the surface, and rock outcrops limit the use of equipment.

This Woodstock soil is in capability subclass VIIs.

Prime Farmland

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. Identification of prime farmland is a major step in meeting the Nation's needs for food and fiber.

The U.S. Department of Agriculture defines prime farmland as the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. Prime farmland produces the highest yields and requires minimal amounts of energy and economic resources, and farming it results in the least damage to the environment.

An area identified as prime farmland must be used for producing food or fiber or must be available for those uses. Thus, urban and built-up land and water areas are not classified as prime farmland.

The general criteria for prime farmland are as follows: a generally adequate and dependable supply of moisture from precipitation or irrigation, favorable temperature and growing-season length, acceptable levels of acidity or alkalinity, few or no rocks, and permeability to air and water. Prime farmland is not excessively erodible, is not saturated with water for long periods, and is not flooded during the growing season. The slope range is mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

The survey area contains about 15,500 acres of prime farmland. That acreage makes up about 3 percent of the total acreage in the survey area and is in the southeast part of the county, mainly in general soil map units 1, 3, and 6. About 75 percent of prime farmland soils is in woodland or is idle. The rest of the acreage is mostly used for crops and pasture. The main crops are corn and hay.

The soil map units that make up prime farmland in the survey area are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4, and the location of each unit is shown on the detailed soil maps at the back of this publication. The soil properties and characteristics that affect use and management of the units are described in the section "Detailed soil map units."

Some soils in table 5 are classified as prime farmland if certain limitations of the soil are overcome. The measures needed to overcome the limitations of such soils are given in parentheses after the name of the map unit. Onsite evaluation of each individual site is needed on areas where measures have been used to overcome limitations.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Marilyn S. Cassidy, District Conservationist, Soil Conservation Service; David R. Whitman, Cooperative Extension Agent, Warren County; and Dr. Shaw Reid, Cornell University, Agronomy Department, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained and the capability subclass for each soil is shown; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local offices of the Soil Conservation Service or the Cooperative Extension Service.

In 1978, 10,389 acres in Warren County was used for farming, according to the Census of Agriculture. Of this total, 3,291 acres was cropland *(16)*.

Crop production can potentially be increased in the southeast part of the county. A large acreage of potentially good cropland is pasture or woodland or is idle *(1)*. In addition to the reserve productive capacity represented by this land, crop yields can be increased by applying the latest technology and appropriate conservation practices to all cropland. This soil survey can facilitate the use of new technology and the application of conservation practices.

The acreage in crops and pasture has increased slightly in the last decade even though more and more land is in recreation and urban uses. Using this soil survey to help make land use decisions that will influence the future of farming is discussed in "Use and Management of the Soils" and "Detailed Soil Map Units."

Principles of Soil Management

General principles of soil management related to crop production are discussed in the following paragraphs.

Soil erosion is a severe hazard on about half the cropland in Warren County, according to the 1967 New York State Inventory of Soil and Water Conservation Needs (*11*). The hazard of erosion is related to slope, the erodibility of the soil, the amount and intensity of rainfall, and the type of plant cover.

Loss of soil through erosion is damaging for several reasons, including loss of nutrients and water, formation of gullies on hillsides, deterioration of soil tilth, detrimental sedimentation downslope, and pollution of streams and water reservoirs. Soil productivity is reduced when the surface layer is lost and increasing amounts of the subsoil are incorporated into the plow layer. This reduction in productivity occurs especially if the subsoil is

fine or moderately fine textured, such as that in Rhinebeck and Hudson soils, or the substratum is compact and restricts roots, such as that in Paxton and Stowe soils. Erosion also reduces productivity on soils that tend to be droughty, for example, Hinckley and Oakville soils, through the decrease of organic matter content. Farmington, Galway, and other soils that are shallow or moderately deep over bedrock are permanently damaged by erosion because of the loss of effective rooting depth. Soils that have a high silt or very fine sand content, like Hartland and Belgrade soils, are very susceptible to erosion.

Erosion control provides protective cover, reduces runoff, and increases water infiltration. Many tillage and conservation practices help to control erosion. Conservation tillage, no till, cover crops, crop residue mixed into the surface, and a cropping system that includes sod crops are effective in controlling erosion on soils that have short, irregular slopes, such as Hudson, Belgrade, and Oakville soils. Contour farming, stripcropping, terraces, and diversions are more suitable on soils that have smooth, long, uniform slopes, such as Charlton and Stowe soils.

Erosion control is generally needed if the slope is more than 3 percent. Hudson, Hartland, and Belgrade soils, all of which are high in silt or very fine sand content and do not have coarse fragments, are the most susceptible to erosion.

Soil blowing, or wind erosion, is a hazard on such soils as the sandy Plainfield soils and in cleared and drained areas of the organic Carlisle and Palms soils. Soil blowing is a hazard particularly if the surface is dry. Windbreaks, controlling the water table in organic soils, and plant cover are effective in controlling soil blowing.

Combinations of conservation practices differ in effectiveness on different soils. Moreover, different combinations can be equally effective on the same soil. The local office of the Soil Conservation Service can assist in planning an effective combination of practices to reduce the hazard of erosion.

Drainage is a major management concern on about one-third of the potential cropland in the survey area. On some wet soils, the production of crops commonly grown in the area is generally not possible unless extensive drainage is installed. Wet soils include poorly drained and very poorly drained Carlisle, Madalin, Palms, Raynham, Shaker, Cathro, and Greenwood soils. Establishing drainage outlets is commonly difficult and expensive because of the low position of these soils on the landscape.

The seasonal high water table limits early planting, plant growth, and harvesting of most crops on somewhat poorly drained soils, such as Rhinebeck soils. Where these soils are drained, crop yields commonly are nearly as high on these soils as on naturally well drained soils.

Some areas of Bice, Stowe, Hartland, Belgrade, Elmridge, and Sutton soils, which are well drained, moderately well drained, or both, include small areas of wetter soils where random subsurface drainage is needed to facilitate more uniform management of fields.

On some gently sloping soils that have a seasonal high water table, such as Woodbridge, Stowe, and Rhinebeck soils, the water table can be lowered by interceptor drains that divert surface runoff and subsurface seepage.

A drainage system varies in design with the kind of soil. A combination of surface and subsurface drainage is needed in most poorly drained and very poorly drained soils. Surface drainage includes open ditches, grassed waterways, land smoothing, diversions, or a bedding system. Subsurface drainage consists mainly of plastic tubing.

Drains must be more closely spaced in slowly permeable soils than in more permeable soils. Subsurface drainage is slow in such soils as Woodbridge, Madalin, and Rhinebeck soils. In some areas of these soils surface drainage is also needed. On rapidly permeable soils, such as Wareham and Castile soils, crops respond well to subsurface drainage if adequate outlets are available.

Information on drainage systems is available at the Warren County Soil and Water Conservation District office.

In many areas stones and boulders on the surface and rock outcrops are limitations to use of the soil for crops and pasture. They limit the use of common farm equipment. In most areas soils where many stones and boulders are on the surface, such as Bice and Hermon soils, are suited only to permanent pasture. Stones and boulders on the surface limit fertilizing, reseeding, and mowing. Lyme soils, which have many stones on the surface, are even more difficult to manage for pasture because of a prolonged seasonal high water table.

In some areas it is feasible to remove the larger stones and boulders from the surface of some soils that have few other limitations. However, it is generally not feasible to overcome limitations in areas of rock outcrops. Woodstock-Rock outcrop complex, sloping, is an example of a map unit that has these kinds of limitations.

Available water capacity is an important consideration in growing crops. Some soils in the county tend to be droughty. Sandy and gravelly soils, soils that have a root-restricting layer, such as a fragipan, and soils that are shallow or moderately deep over bedrock tend to have a fairly low capacity to store water available for plant growth. The sandy and gravelly Hinckley soils, the sandy Plainfield soils, and the shallow Farmington soils have a low or very low available water capacity. Green manure crops, crop residue from conservation tillage, cover crops, and manure help to increase the organic matter content, to improve soil tilth, and to increase the available water capacity on these droughty soils. On the

droughty soils irrigation is needed in dry years for best crop yields.

Soil tilth is an important factor in the germination of seedlings, the infiltration of water, and the ease of cultivation. Soils in good tilth generally are granular and porous. Tillage practices strongly influence soil tilth. Excessive tillage tends to reduce organic matter content and breaks down soil structure. Some soils that are deep, well drained to excessively drained, and coarse textured or moderately coarse textured, such as Plainfield and Hinckley soils, can be tilled with little concern about deterioration of soil tilth. Wetter and finer textured soils, however, such as Hudson, Rhinebeck, and Madalin soils, must be tilled at the proper moisture content to prevent deterioration of the natural structure. Plowing or cultivating when these soils are wet causes puddling and results in a hard surface crust and clods when the soils dry.

Cultivation at the proper soil moisture content, cover crops, green manure crops, sod crops in the crop rotation, crop residue mixed into the surface, and manure help to keep the soils granular and porous.

Soil fertility is critical for crop production. All soils in the county need lime, fertilizer, or both, for best crop yields. The amounts needed depend on the results of a soil test, the needs of the particular crop, and the desired level of yield.

Organic matter content is important in assessing fertility. It averages about 3.5 percent in the surface layer of the soils in Warren County. Poorly drained and very poorly drained soils, such as Madalin soils, have a somewhat higher organic matter content. Nitrogen is released from the organic matter, but much of it is in complex forms that cannot be used by plants until it is digested by micro-organisms. A supplement of nitrogen fertilizer is needed. Management practices that increase organic matter content, such as green manure crops, hay crops, and crop residue mixed into the soil, improve the nitrogen content.

Timeliness of nitrogen fertilization is important for maximum utilization by plants. Nitrogen is lost through leaching in rapidly permeable soils, such as Hinckley soils, or by denitrification in wetter and less permeable soils, such as Rhinebeck soils. Best results are obtained if small amounts of nitrogen are applied at timely intervals, at plantings, and then as a side dressing while the crop is growing.

The soils in Warren County are generally low in natural phosphorous content. Coarse textured soils, such as Hinckley and Plainfield soils, tend to be very low in phosphorous. Adding appropriate amounts of phosphate in the form of commercial fertilizer is essential for good growth.

Most of the soils are low to medium in natural potassium content. Soils such as Hudson, Rhinebeck, and Madalin soils, however, which have a clayey subsoil, are somewhat higher in potassium content. Even soils that have a fairly high content of potassium require additional potassium for best yields of most crops.

Lime is needed in most of the soils in the survey area to raise the pH to an acceptable level for best yields of most crops.

Additions of lime and fertilizer should be based on the results of soil tests. For assistance in obtaining soil tests and recommendations, farmers and other land users should consult their local Cooperative Extension agent. New research findings and fertilizer recommendations are available in current editions of *Cornell Recommends for Field Crops* and *Vegetable Production Recommendations,* both of which were prepared by the staff of the New York State College of Agriculture, Cornell University, Ithaca, New York. In the absence of soil tests, these references, along with this publication, can be used as a guide in determining lime and fertilizer needs.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. The levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in table 6.

Woodland Management and Productivity

Robert E. Smith, Jr., forester, Soil Conservation Service, helped to prepare this section.

Most of the land area of the county is forested. Of the forested areas, about 65 percent is commercial forest land (*4*). The rest is reserved from timber harvest under state law.

Softwoods make up the largest acreage, about 178,000 acres, of the major forest types; northern hardwoods make up 140,000 acres, and oaks make up 18,000 acres. The largest net volume of growing stock is white pine, which makes up about 35 percent of the total. In addition, white pine makes up about 42 percent of the net volume of sawtimber on commercial forest land.

The acreage in forest land has increased only 2 percent since 1968. However, since then the volume of growing stock and that of sawtimber have increased 49 percent and 53 percent, respectively.

More than 70 percent of the privately owned forest land has potential for producing 50 cubic feet or more of wood per acre annually, according to the Forest Service (*12*).

Most of the soil map units in the county need intensive forest management (*15*).

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed in the tables. The table gives the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. A rating of moderate to moderately high potential productivity applies to 75 percent of the soil map units in the county. A rating of low potential productivity applies to 15 percent, and a rating of high applies to 10 percent. The second part of the symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *R* indicates steep slopes; *W*, excessive water in or on the soil; *D*, restricted rooting depth caused by bedrock, hardpan, or other restrictive

layer; and *S*, sandy texture. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R,W,D,and S. The percentages of map units that have limitations are as follows: sandy texture (S), 22 percent; excessive water (W), 20 percent; steep slopes (R), 15 percent; and restricted rooting depth (D), 13 percent.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that erosion can occur as a result of site preparation or following cutting operations and where the soil is exposed, for example, roads, skid trails, fire lanes, and log handling areas. Forests that are abused by fire or overgrazing are also subject to erosion. The ratings for the erosion hazard are based on the percent of the slope and on the erosion factor K shown in table 16. A rating of *slight* indicates that no particular measures to prevent erosion are needed under ordinary conditions. A rating of *moderate* indicates that erosion control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

The proper construction and maintenance of roads, trails, landings, and fire lanes will help overcome the erosion hazard.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that equipment use normally is not restricted either in kind of equipment that can be used or time of year because of soil factors. If soil wetness is a factor, equipment use can be restricted for a period not to exceed 2 months. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If soil wetness is a factor, equipment use is restricted for 2 to 6 months. A rating of *severe* indicates that equipment use is severely restricted either in kind of equipment or season of use. If soil wetness is a factor, equipment use is restricted for more than 6 months.

Choosing the most suitable equipment and timing harvesting and other management operations to avoid seasonal limitations help overcome the equipment limitation.

Seedling mortality refers to the probability of death of naturally occuring or planted tree seedlings as influenced by kinds of soil or topographic conditions. The factors considered in rating the soils for seedling mortality are texture of the surface layer, depth and duration of the water table, rock fragments in the surface layer, rooting depth, and aspect of the slope. A rating of *slight* indicates that under usual conditions the expected mortality is less than 25 percent. A rating of *moderate* indicates that the expected mortality is 25 to 50 percent. Extra precautions are advisable. A rating of *severe* indicates that the expected mortality is more than 50 percent. Extra precautions are important. Replanting may be necessary.

The use of special planting stock and special site preparation, such as bedding, furrowing, or surface drainage, can help reduce seedling mortality.

Windthrow hazard is the likelihood of trees being uprooted (tipped over) by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions are a seasonal high water table and bedrock or a fragipan or other limiting layer. A rating of *slight* indicates that normally no trees are blown down by the wind. Strong winds may break trees but do not uproot them. A rating of *moderate* indicates that moderate or strong winds occasionally blow down a few trees during periods of soil wetness. A rating of *severe* indicates that moderate or strong winds may blow down many trees during periods of soil wetness.

The use of specialized equipment that does not damage surficial root systems during partial cutting operations can help reduce windthrow. Care in thinning or no thinning also can help reduce windthrow.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Common trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. Figure 8 shows the average annual wood volume yields, based on site index, that can be expected from the major forest tree species in the county.

The first tree species listed under common trees for a soil is the indicator species for that soil. The indicator species is the species that is common in the area and is generally the most productive on the soil.

Trees to plant are those that are suited to the soil and are planted for commercial wood production. Also listed are tree species suitable for Christmas tree production and windbreaks.

Recreation

Mountains, lakes, and streams are popular attractions in Warren County. Boating, fishing, swimming, golfing, camping, hiking, hunting, horseback riding, skiing, snowmobiling, and sightseeing are available to visitors. Other tourist attractions are the sites of numerous historic events that have occurred in Warren County and adjacent counties.

A civic center in Glens Falls holds sporting events and other attractions throughout the year.

WOOD VOLUME YIELDS BY SPECIES AND SITE INDICES

Site index	Northern hardwoods	Northern red oak	Eastern white pine
	cubic feet per acre		
50	32	34	81
55	35	38	92
60	38	43	102
65	40	47	114
70	43	52	127
75	47	57	137
80	50	62	147

Figure 8.—The estimated wood volume yields for the major forest tree species, based on site indices.

The tourist industry is of prime economic importance. Many hotels, motels, and state private campgrounds are in the county, especially around Lake George.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water (fig. 9). Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant

cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be

Figure 9.—Deer are one of many species of wildlife that inhabit Warren County. These deer are on an area of Bice fine sandy loam, 3 to 8 percent slopes. (Photo courtesy of Steve Monroe)

expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, barley, buckwheat, and sunflower.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, timothy, bromegrass, clover, birdsfoot trefoil, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, pokeweed, aster, and dandelions.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, beech, birch, cherry, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are honeysuckle, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, arrowhead, pickerel weed, rushes, sedges, cattails, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, swamps, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include meadow vole, meadowlark, field sparrow, woodchuck, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include ruffed grouse, woodcock, thrushes, woodpeckers, snowshoe hare, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey,

determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a firm, compact layer, and the available water capacity in the upper 40 inches of the soil affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so

difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a firm, compact layer and flooding affect absorption of the effluent. Large stones, boulders, and bedrock or a firm, compact layer interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a firm, compact layer, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a firm, compact layer, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a firm, compact layer, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of

sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so

difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Edward A. Fernau, Senior Soil Engineer, New York State Department of Transportation, Soil Mechanics Bureau, helped to prepare this section.

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 15.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture *(10)*. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 15.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074

millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that

can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

Some soils in table 17 are assigned to two hydrologic soil groups. Dual grouping is used for one of two reasons. Some soils have a seasonal high water table but can be drained. In this instance the first letter applies to the drained condition of the soil and the second letter to the undrained condition. In some soils that are less than 20 inches deep to bedrock, the first letter applies to areas where the bedrock is cracked and pervious and the second letter to areas where the bedrock is impervious or where exposed bedrock makes up more than 25 percent of the surface of the soil.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable period of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional, common,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). *Common* is used when classification as occasional or frequent does not affect interpretations. Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely, thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely, grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table, that is, *perched, artesian,* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table-Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by the New York State Department of Transportation, Soil Mechanics Bureau.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO); Liquid limit—T 89 (AASHTO); Plasticity index—T 90 (AASHTO); Moisture density, Method C—T 99 (AASHTO); Shrinkage—D 427 (ASTM).

Engineering Properties of Geologic Deposits

By Edward A. Fernau, soils engineer, New York State Department of Transportation, Soil Mechanics Bureau.

The engineering properties of the various, unconsolidated, geologic deposits in Warren County and their relation to soils are discussed in this section. This discussion should be helpful to planners, designers, engineers, contractors, and others working on construction projects involving earthy materials. Note that soil engineering terms do not always have the same meaning as similar, soil science terms.

The geologic deposits in Warren County are described according to their mode of deposition. The deposits are glacial till, outwash, ice-contact, delta, lacustrine, alluvial, and organic. The engineering properties of each deposit is determined mainly by the texture of the material and the internal structure of the landform. They are also determined by the position of the deposit on the landscape and the depth of the water table. In Warren County the geologic deposits are divided into the following categories: deep till deposits, shallow-to-rock deposits, stratified coarse-grained deposits, stratified fine-grained deposits, and organic deposits.

Deep till deposits are unstratified, highly variable, mixed material ranging in size from rock fragments to clay. This material was scoured and transported from nearby sources by glacial ice and deposited as a ground

moraine or end moraine. Bedrock is generally more than 60 inches beneath the soil surface, but in some small areas bedrock is closer to the surface or scattered rock outcrops occur. The individual rock and mineral fragments in the soil generally reflect the types of bedrock in the immediate area.

Bice, Charlton, Hermon, Lyme, Marlow, Massena, Paxton, Peru, Schroon, Stowe, Sutton, and Woodbridge soils formed in these deposits. These soils are the most dense and compact of the unconsolidated geologic deposits in the county. Most of the tills have been subjected to the compacting weight of overlying ice. Deep, till soils are on slopes ranging from nearly level to very steep, but most are gently sloping or sloping. On many landscapes cutting and filling is involved during construction. The soils generally provide stable, relatively incompressible foundations for engineering works. Fill material from these deposits, when properly compacted, generally provide stable embankments. Steep cutbanks commonly are subject to surface sloughing and erosion. Some of these glacial till soils, such as Hermon soils, are sandy and thus are a source of sand and gravel for some types of construction.

Shallow-to-rock deposits are unstratified, mixed glacial till deposited as a veneer over bedrock. The soil is generally 12 to 48 inches thick, and have some areas of rock outcrops. The landforms and topography are generally bedrock controlled. Farmington, Galway, Lyman, and Woodstock soils formed in glacial till over bedrock. Farmington and Galway soils formed in glacial till overlying limestone or dolostone. Lyman and Woodstock soils formed in glacial till overlying metamorphic rocks. The bedrock units are described in the section "Physiography and Geology."

The soils that formed in shallow-to-rock deposits of glacial till have adequate foundation strength for most construction purposes. The primary engineering concerns in some areas are related to the underlying bedrock and ground water conditions. Fill material is limited in quantity because of the closeness of bedrock.

Stratified coarse-grained deposits are materials dominated by gravel and sand sorted by glacial melt water into layered or stratified deposits and the coarser materials deposited by fluvial action. They are on such landforms as outwash plains and terraces, ice-contact kames and eskers, and the coarser areas of deltas and flood plains. The strata within these deposits may be well sorted or poorly sorted and may range in particle size from cobbles to silt. The deposits are generally loose and porous. Permeability is moderately rapid or rapid.

Castile and Hinckley soils formed in gravelly outwash and ice-contact deposits. Agawam, Elnora, Oakville, Plainfield, and Wareham soils formed in the more sandy areas of outwash plains and deltas, and Middlebury and Tioga soils formed in alluvium over sand and gravel.

The soils that formed in coarse-grained deposits generally have relatively high strength and small compressibility. Most of these soils are loose and porous, are not highly erodible, but are subject to some settlement if vibrated. Middlebury and Tioga soils are subject to common flooding.

These gravel and sand deposits have many uses as a construction material. Depending on gradation, soundness, and plasticity, they may be used for fill material for highway embankments and for parking areas and developments and as fill material to decrease stress on underlying soils to allow progress of construction operations. They may also be used as subbase for pavements, wearing surfaces for driveways, parking lots, and some roads, material for highway shoulders, and free draining backfill for structures and pipes. In addition they may be used as outside shells of dams to impound water, slope protection blankets to drain and help to stabilize wet, cut slopes, and sources of sand and gravel for general use.

Stratified fine-grained deposits consist mainly of lacustrine, fine-grained sediment transported by glacial melt water and deposited in quiet, proglacial lakes and ponds. Some of these deposits are veneers of coarser grained material over fine-grained sediment. Although these deposits are high in fine sand and silt content, some of the finer-grained soils have distinct laminations or layers, generally of silt- and clay-sized particles. These deposits are plastic and sticky because of the clay content.

Hartland and Raynham soils formed in deep, lake-laid fine sand and silt deposits. Hudson, Madalin, and Rhinebeck soils formed in deep silt and clay deposits. Elmridge and Shaker soils formed in veneer deposits of fine sand and silt over silt and clay deposits.

These deposits have relatively low strength because of their fine texture and high moisture content. They are generally compressible and subject to some settlement. The soils that have a high fine sand and silt content are less compresssible but are highly erodible and subject to frost action.

The soils that formed in fine-grained deposits are difficult to use for engineering works, especially in areas that are flat, wet, and subject to ponding. Madalin soils, for example, are in three areas. Onsite investigation is needed on sites for embankments and heavy structures or buildings to determine strength and settlement characteristics and the effects of ground water.

Organic deposits are mostly accumulations of plant remains. In places they include a minimal amount of mineral soil. They are in very poorly drained depressions and bogs that are covered with water during much of the year.

Carlisle and Greenwood soils and Saprists and Aquepts formed in deep, organic deposits. Palms soils formed over lacustrine deposits, and Cathro soils formed in coarse-grained deposits. The soils that formed in

organic deposits are entirely unsuitable as sites for foundations for engineering works because they are wet, weak, and highly compressible. Generally, the organic material should be removed to suitable underlying material and the area backfilled with a suitable material. Backfilling over organic deposits causes long-term settlement.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*14*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquept (*Aqu*, meaning water, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquepts (*Hapl*, meaning minimal horizonation, plus *aquept*, the suborder of the Inceptisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Aeric* identifies the subgroup that is better aerated than typical for the great groups. An example is Aeric Haplaquepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*10*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*14*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Agawam Series

The Agawam series consists of deep, well drained soils. These soils are on nearly level deltas, terraces, and outwash plains. They formed in water-deposited sands. Slope ranges from 0 to 3 percent.

Agawam soils are near Hartland, Hinckley, and Oakville soils. Agawam soils have less silt in the subsoil than Hartland soils, less gravel than Hinckley soils, and less sand in the upper part of the subsoil than Oakville soils.

Typical pedon of Agawam fine sandy loam, 0 to 3 percent slopes, in the town of Horicon, in an excavation within a grassy area behind a motel on the northwest side of Crystal Lake, 3/4 mile west of intersection of County Route 31 and South Horicon Road:

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many medium roots; strongly acid; clear smooth boundary.
B21—4 to 12 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; slightly acid; clear smooth boundary.
B22—12 to 24 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak fine granular structure; friable; few coarse roots; 2 percent coarse fragments; slightly acid; clear smooth boundary.
C1—24 to 38 inches; olive gray (5Y 5/2) loamy fine sand; massive; very friable; slightly acid; clear wavy boundary.
C2—38 to 60 inches; olive gray (5Y 5/2) loamy fine sand; single grain with lenses of very fine sand; loose; slightly acid.

The solum ranges from 15 to 30 inches in thickness. Coarse fragments range, by volume, from 0 to 10 percent in the solum, 0 to 30 percent in the C horizon above a depth of 40 inches, and 0 to 60 percent below a depth of 40 inches. In unlimed areas reaction ranges from very strongly acid to slightly acid throughout.

The A1 horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 to 3. Some pedons have an Ap horizon that has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 to 4. The A horizon is fine sandy loam, very fine sandy loam, or loam. In some pedons a thin A2 horizon is below the A1 horizon.

The upper part of the B horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 3 to 8. The lower part has hue of 10YR to 5Y, value of 4 to 7, and chroma of 3 to 8. The B horizon is fine sandy loam, very fine sandy loam, or loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 7, and chroma of 1 to 4. It is stratified loamy fine sand, loamy sand, fine sand, or their gravelly or very gravelly analog.

Aquepts

Aquepts are deep, very poorly drained soils in depressions and nearly level areas adjacent to natural or manmade lakes, ponds, and other bodies of open water. These soils are ponded with shallow water during most of the year. Slope ranges from 0 to 1 percent.

Aquepts are commonly near Saprists, which formed in organic deposits. They are also near the mineral Lyme and Madalin soils and the organic Palms, Carlisle, Cathro, and Greenwood soils.

Aquepts differ greatly from area to area; consequently, a typical pedon is not given. In most areas the surface layer is thin and black to gray. Commonly it is organic material as much as 16 inches thick. Commonly the soils are mottled, gray, and rusty at a depth of 20 inches or less.

The A horizon is 4 to 8 inches thick. It is mucky fine sandy loam to loam. The B horizon is about 20 to 40 inches thick. The B and C horizons have hue of 10YR to 2.5Y, value of 4 or 5, and chroma of 1 to 3. Mottles are common. The B horizon is loam, fine sandy loam, sandy loam, or loamy sand. Reaction is strongly acid to neutral.

Belgrade Series

The Belgrade series consists of deep, moderately well drained soils on terraces, and on foot slopes on uplands. These soils formed in wind- or water-deposited material that has a high content of coarse silt and very fine sand. Slope ranges from 0 to 8 percent.

Belgrade soils are in a drainage sequence with the well drained Hartland soils and the somewhat poorly drained or poorly drained Raynham soils.

Typical pedon of Belgrade silt loam, 3 to 8 percent slopes, in the town of Queensbury, 100 feet south of Walker Lane, 500 feet west of Bay Road:

Ap—0 to 10 inches; dark brown (10YR 3/3) silt loam; moderate fine granular structure; friable; few fine roots; slightly acid; abrupt smooth boundary.
B21—10 to 14 inches; yellowish brown (10YR 5/6) very fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; slightly acid; clear wavy boundary.
B22—14 to 22 inches; yellowish brown (10YR 5/4) very fine sandy loam; many medium distinct strong brown (7.5YR 5/6) and many medium faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; slightly acid; clear smooth boundary.
C1—22 to 42 inches; brown (10YR 5/3) very fine sandy loam; common medium distinct yellowish brown (10YR 5/8) and common medium faint light brownish gray (10YR 6/2) mottles; very weak thin platy structure; friable; neutral; abrupt smooth boundary.
IIC2—42 to 62 inches; grayish brown (2.5Y 5/2) loamy sand; common distinct yellowish brown (10YR 5/6) mottles; single grain; loose; slightly acid.

The solum ranges from 20 to 30 inches in thickness. Depth to contrasting textural material is more than 40 inches. The content of coarse fragments is less than 5 percent in the solum and 0 to 40 percent in the lower part of the substratum. In unlimed areas reaction is very strongly acid to slightly acid in the solum and slightly acid or neutral in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The B horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 3 to 6. It is mottled in the lower part. Its texture is silt loam or very fine sandy loam. Subhorizons in some pedons are loamy very fine sand.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4. It is silt loam or very fine sandy loam in the upper part and sandy loam to stratified sand and gravel in the lower part below a depth of 40 inches.

Bice Series

The Bice series consists of deep, well drained soils. These soils are on glacial till uplands. In many areas large stones and boulders are on the surface. Slope ranges from 3 to 45 percent.

Bice soils are in a drainage sequence with the moderately well drained Schroon soils and the poorly drained Lyme soils. Bice soils are near Stowe and Woodstock soils. Unlike Bice soils, Stowe soils have a fragipan. Bice soils are deeper to bedrock than shallow Woodstock soils.

Typical pedon of Bice very bouldery fine sandy loam, sloping, in the town of Queensbury, 1,500 feet southeast of Wilkie Reservoir and 100 feet north of Halfway Creek, in woodland:

O2—2 inches to 0; very dark gray (10YR 3/1) partly decomposed leaf litter; many fine roots; very strongly acid.

A2—0 to 3 inches; light brownish gray (10YR 6/2) fine sandy loam; weak fine granular structure; friable; many fine roots; 5 percent coarse fragments; very strongly acid; abrupt smooth boundary.

B21—3 to 7 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; common fine roots; 5 percent coarse fragments; very strongly acid; clear smooth boundary.

B22—7 to 12 inches; yellowish brown (10YR 5/6) fine sandy loam; moderate fine subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B3—12 to 22 inches; olive brown (2.5Y 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

C—22 to 60 inches; grayish brown (2.5Y 5/2) sandy loam; massive; firm; 5 percent coarse fragments; moderately acid.

The solum ranges from 20 to 36 inches in thickness. Coarse fragments make up 5 to 30 percent, by volume, of the solum, and the percentage increases with depth in some pedons. Reaction is moderately acid to very strongly acid throughout.

The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. It is sandy loam or fine sandy loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam, sandy loam, or their gravelly analog.

The C horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is loam, fine sandy loam, sandy loam, or their gravelly analog. Some pedons have lenses or pockets of loamy sand. Consistence is friable or firm.

Carlisle Series

The Carlisle series consists of deep, very poorly drained, organic soils that formed in woody, organic deposits in bogs and swamps. Slope ranges from 0 to 2 percent.

Organic Carlisle soils are near poorly drained and very poorly drained, clayey Madalin soils and poorly drained, somewhat poorly drained and sandy Wareham soils. They are also commonly adjacent to moderately deep, organic Palms soils.

Typical pedon of Carlisle muck, in the town of Queensbury, approximately 0.5 mile east of the junction of Quaker Road and Ridge Road, 100 feet east of Quaker Road, in a wooded area:

Oa1—0 to 10 inches; black (10YR 2/1) broken face, dark reddish brown (5YR 2/2) rubbed muck (sapric material); 10 percent fibers, 2 percent rubbed; weak fine granular structure; nonsticky, nonplastic; many fine roots; neutral; clear smooth boundary.

Oa2—10 to 35 inches; black (10YR 2/1) broken face, dark reddish brown (5YR 2/2) rubbed muck (sapric material); 10 percent fibers, 2 percent rubbed; massive; nonsticky, slightly plastic, few fine roots; neutral; clear smooth boundary.

Oa3—35 to 63 inches; dark reddish brown (5YR 2/2) broken face, very dusky red (2.5YR 2/2) rubbed muck (sapric material); 3 percent fibers, about 3 percent rubbed; massive; nonsticky, slightly plastic; neutral; clear smooth boundary.

Oa4—63 to 74 inches; dark reddish brown (5Y 2/2) broken face and rubbed muck (sapric material); 20 percent fibers; 4 percent rubbed; massive; nonsticky, slightly plastic; neutral; clear smooth boundary.

Oa5—74 to 80 inches; dark reddish brown (5YR 2/2) rubbed muck (sapric material); 40 percent fibers, 6 percent rubbed; massive; nonsticky, slightly plastic; moderately acid.

Depth to bedrock is more than 60 inches. Organic deposits are more than 51 inches thick. Woody fragments, including twigs, roots, and logs, make up as much as 20 percent of the volume in some pedons. Reaction is moderately acid to neutral.

The surface tier is black sapric material.

The subsurface and bottom tiers have hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. They are

dominantly sapric material that has a rubbed fiber content of less than 10 percent. Some layers of some pedons have hemic and fibric material.

Castile Series

The Castile series consists of deep, moderately well drained soils on outwash plains and terraces. Slope ranges from 0 to 3 percent.

Castile soils are near and in a drainage sequence with well drained Hinckley soils and poorly drained or somewhat poorly drained Wareham soils in depressions.

Typical pedon of Castile gravelly fine sandy loam, in the town of Bolton, approximately 0.5 mile north of the junction of New Vermont Road and Federal Hill Road, 45 yards north of New Vermont Road:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) gravelly fine sandy loam; weak fine granular structure; friable; many fine roots; 15 percent coarse fragments; moderately acid; abrupt smooth boundary.

B21—8 to 11 inches; dark brown (10YR 4/3) very gravelly fine sandy loam; weak fine and medium subangular blocky structure; friable; medium fine roots; 40 percent coarse fragments; moderately acid; clear wavy boundary.

B22—11 to 22 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam; common fine distinct strong brown (7.5Y 5/6) mottles; weak medium subangular blocky structure; friable; common fine roots; 25 percent coarse fragments; moderately acid; clear wavy boundary.

B3—22 to 32 inches; grayish brown (10YR 5/2) gravelly fine sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; 30 percent coarse fragments; moderately acid; clear wavy boundary.

IIC—32 to 60 inches; dark brown (10YR 4/3) stratified sand and gravel; loose; 60 percent coarse fragments; slightly acid.

The solum ranges from 24 to 40 inches in thickness. Coarse fragments make up 15 to 35 percent, by volume, of the A horizon, 20 to 60 percent of the B horizon, and 35 to 70 percent of the C horizon. Coarse fragments are mainly gravel, but include cobblestones and a few stones. Reaction ranges from very strongly acid to moderately acid in the solum and strongly acid to neutral in the substratum.

Th Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. Fine earth fraction is sandy loam, fine sandy loam, or loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. Fine earth fraction is sandy loam, fine sandy loam, loam, or silt loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. Fine earth fraction is loamy sand or sand to loam and commonly stratified.

Cathro Series

The Cathro series consists of very poorly drained organic material 16 to 51 inches deep over mineral material. These soils are in depressions on uplands. Slope is less than 2 percent.

Cathro soils formed in similar organic material, and are commonly near deep Greenwood soils. They are commonly near poorly drained, mineral Lyme soils and, in areas of freshwater marsh, Saprists and Aquepts, inundated.

Typical pedon of Cathro muck, in an area of Cathro and Greenwood mucks, in the town of Chester, 0.9 mile south of the junction of Atateka Drive and Potter Brook Road, 100 yards east of Potter Brook Road, in a swamp:

Oe1—0 to 4 inches; dark reddish brown (5YR 2/2), and dark reddish brown (5YR 3/2) rubbed mucky peat (hemic material); about 50 percent fibers, about 25 percent rubbed; weak fine subangular blocky structure; nonsticky; primarily herbaceous fibers; moderately acid; clear wavy boundary.

Oa2—4 to 18 inches; dark reddish brown (5YR 2/2) and very dark gray (5YR 3/1) muck (sapric material); about 35 percent fibers, about 10 percent rubbed; weak fine granular structure; nonsticky; primarily herbaceous fibers; moderately acid; clear wavy boundary.

Oa3—18 to 30 inches; black (5YR 2/1) on broken face and pressed muck (sapric material); about 35 percent fibers, about 10 percent rubbed; massive; slightly sticky; moderately acid; clear smooth boundary.

Oa4—30 to 46 inches; black (10YR 2/1) on broken face and pressed muck (sapric material); about 25 percent fibers, about 5 percent rubbed; massive; slightly sticky; moderately acid; clear smooth boundary.

IIC1—46 to 48 inches; dark grayish brown (10YR 4/2) silt loam; common medium and coarse distinct dark reddish brown (5YR 3/3) mottles; massive; nonsticky; slightly acid; abrupt smooth boundary.

IIC2—48 to 59 inches; dark grayish brown (2.5Y 4/2) silt loam; massive; nonsticky; neutral; clear smooth boundary.

IIC3g—59 to 62 inches; greenish gray (5GY 5/1) very fine sandy loam; massive; very friable; neutral.

Depth to the loamy IIC horizon ranges from 16 to 50 inches. The organic layers have hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. They are moderately acid to mildly alkaline.

The surface tier is hemic or sapric material.

The subsurface and bottom tiers are dominantly sapric material, and make up more than half of the organic material above the IIC horizon. These tiers are generally massive, but some pedons have very coarse blocks or prisms which part to weak platy or granular structure.

The IIC horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is sandy loam to silt loam and neutral to moderately alkaline.

Charlton Series

The Charlton series consist of deep, well drained soils on uplands. These soils formed in glacial till deposits. Stones are scattered on the surface in some areas. Slope ranges from 3 to 25 percent.

Charlton soils are in a drainage sequence with moderately well drained Sutton soils and poorly drained or somewhat poorly drained Massena soils. Charlton soils are near well drained Paxton soils and moderately well drained Woodbridge soils, but do not have the firm, dense layer of these soils.

Typical pedon of Charlton fine sandy loam, 3 to 8 percent slopes, in the town of Queensbury, 2,100 feet northwest of the intersection of Bay and Lockhart Roads, 150 feet north of Lockhart Road:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—7 to 11 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; friable; common fine roots; 5 percent coarse fragments; moderately acid; clear wavy boundary.

B22—11 to 19 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine and medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; moderately acid; clear wavy boundary.

B23—19 to 28 inches; light olive brown (2.5Y 5/4) fine sandy loam; massive; friable; 10 percent coarse fragments; moderately acid; clear wavy boundary.

C—28 to 60 inches; grayish brown (2.5Y 5/2) sandy loam; massive; friable; 5 percent coarse fragments; moderately acid.

The solum ranges from 20 to 36 inches in thickness. Coarse fragments make up 5 to 15 percent, by volume, of the surface layer and 5 to 30 percent of the subsoil and the substratum. In some pedons the percentage of coarse fragments increases with depth. Reaction is very strongly acid to moderately acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. Fine earth fraction is fine sandy loam, very fine sandy loam, or loam.

The B21 horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 6. The B22 and B23 horizons have hue of 10YR to 5Y and value and chroma of 4 to 6. Fine earth fraction is fine sandy loam or loam. The B horizon is massive or has weak subangular blocky or granular structure. It is very friable or friable.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. Fine earth fraction is fine sandy loam or sandy loam. It is massive or has platy structure, and is friable or firm.

Elmridge Series

The Elmridge series are deep, moderately well drained soils on outwash and lacustrine plains. These soils formed in a thin mantle of loamy deposits that overlie clayey, lake-laid sediments. Slope ranges from 3 to 8 percent.

Elmridge soils are in a drainage sequence with poorly drained Shaker soils. Elmridge soils are near sandy Oakville soils and near Hartland and Raynham soils, which have a high silt content.

Typical pedon of Elmridge fine sandy loam, 3 to 8 percent slopes, in the town of Queensbury, 0.4 mile south of cemetery, near Lake Sunnyside Road, at the south end of lake:

Ap—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; moderate fine granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

B21—8 to 12 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; common fine roots; moderately acid; clear wavy boundary.

B22—12 to 19 inches; yellowish brown (10YR 5/6) fine sandy loam; common fine distinct dark reddish brown (5YR 3/3) and few fine distinct strong brown (7.5YR 5/6) mottles; weak fine and medium subangular blocky structure; very friable; few fine roots; slightly acid; clear wavy boundary.

B23—19 to 23 inches; yellowish brown (10YR 5/6) fine sandy loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak fine granular structure; very friable; slightly acid; clear wavy boundary.

IIC—23 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine distinct yellowish red (5YR 4/6) mottles; massive; firm; neutral.

The solum ranges from 20 to 38 inches in thickness. Coarse fragments range from 0 to 3 percent, by volume, in the solum and are generally not in the substratum. Clay content ranges from 2 to 8 percent, by volume, in the solum and from 35 to 55 percent in the substratum. Reaction ranges from very strongly acid to slightly acid in the solum and from moderately acid to mildly alkaline in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is very fine sandy loam, fine sandy loam, sandy loam, or loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 6. It has hue of 2.5Y in the lower part only. It is fine sandy loam, sandy loam, or loam. Consistence is very friable or friable.

Some pedons have a thin IIB horizon that has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. It is clay loam, silty clay loam, or silty clay.

The IIC horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 or 3. It is clay, silty clay loam, or silty clay.

Elnora Series

The Elnora series consists of deep, moderately well drained soils on terraces, deltas, and outwash plains. These soils formed in sandy fluvial deposits. Slope ranges from 0 to 3 percent.

Elnora soils are in a drainage sequence with well drained Oakville soils and somewhat poorly drained or poorly drained Wareham soils.

Typical pedon of Elnora loamy fine sand, in the town of Queensbury, 250 feet south of Sherman Avenue, 1 mile west of the intersection of Sherman Avenue and I-87, in a cultivated area.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B2—10 to 20 inches; yellowish brown (10YR 5/6) loamy fine sand; common medium distinct yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure parting to single grain; friable; few fine roots; moderately acid; clear wavy boundary.

B3—20 to 28 inches; yellowish brown (10YR 5/4) fine sand; common coarse prominent yellowish red (5YR 4/6) and common fine distinct grayish brown (10YR 5/2) mottles; single grain; loose; few fine roots; moderately acid; clear wavy boundary.

C—28 to 60 inches; grayish brown (2.5Y 5/2) fine sand; few medium distinct strong brown (7.5YR 5/6) mottles; single grain; loose; slightly acid.

The solum ranges from 15 to 35 inches in thickness. Coarse fragments range from 0 to 2 percent in the solum and the substratum. In unlimed areas reaction ranges from extremely acid to slightly acid in the surface layer and the subsoil and strongly acid to neutral in the substratum.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. It is fine sandy loam to loamy fine sand.

The B horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6. It is loamy fine sand or fine sand. Mottles have chroma of 2 or less below a depth of 15 inches.

The C horizon has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 4. It is fine sand or loamy fine sand.

Farmington Series

The Farmington series are shallow, somewhat excessively drained or well drained soils on glacial till plains. These soils formed in glacial till and are underlain by limestone bedrock at a depth of 10 to 20 inches. Slope ranges from 0 to 15 percent.

Farmington soils are near moderately deep Galway soils, which have bedrock at a depth of 20 to 40 inches.

Typical pedon of Farmington loam, 0 to 8 percent slopes, in the town of Queensbury, 50 yards north of Dix Avenue, approximately 0.5 mile west of intersection of Quaker Road and Dix Avenue:

Ap—0 to 8 inches; dark brown (10YR 3/3) loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine roots; 5 percent coarse fragments; neutral; clear smooth boundary.

B2—8 to 13 inches; yellowish brown (10YR 5/6) loam; weak subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; neutral; abrupt smooth boundary.

R—13 inches; gray (N 5/) limestone bedrock.

The solum thickness and depth to bedrock range from 10 to 20 inches. Coarse fragments range from 5 to 15 percent, by volume, in the surface layer and 5 to 30 percent in the subsoil. In unlimed areas reaction is strongly acid to slightly acid in the surface layer and moderately acid to mildly alkaline in the subsoil.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is fine sandy loam, loam, or silt loam.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. It is fine sandy loam, loam, or silt loam, or their gravelly analog. Consistence is very friable or friable.

Fluvaquents

Fluvaquents are deep, somewhat poorly drained to very poorly drained soils adjacent to streams. These soils formed in recent, alluvial deposits. They have little or no soil profile development and are subject to frequent flooding. Slope ranges from 0 to 5 percent.

Fluvaquents are mapped with Udifluvents. They are commonly near Tioga and Middlebury soils, but are in low areas where the adjacent stream, through scouring, cutting, and lateral erosion, frequently shifts the soil material from place to place.

Fluvaquents differ greatly from place to place; thus a typical pedon is not given. Depth to bedrock is generally more than 60 inches. Coarse fragments, including gravel, cobblestones, and flagstones, range, by volume, from 0 to 80 percent. Reaction is very strongly acid to mildly alkaline.

The A horizon has hue of 5YR to 5Y, value of 2 to 4, and chroma of 0 to 2. It ranges from fine sand to silty clay loam and includes their channery, gravelly, or very gravelly analogs. It is 1 to 6 inches thick.

The C horizon has hue of 5YR to 5Y, value of 3 to 6, and chroma of 0 to 3. It is commonly mottled. It ranges from sand to silty clay loam and includes their gravelly, channery, cobbly, or very gravelly analog. It is friable or loose.

Galway Series

The Galway series consists of moderately deep, well drained and moderately well drained soils on landscapes where the surface topography is influenced by the underlying bedrock. Slope ranges from 3 to 8 percent.

Galway soils are near shallow, well drained Farmington soils.

Typical pedon of Galway loam, 3 to 8 percent slopes, in the Town of Queensbury, 150 feet north of Dix Avenue, 660 feet west of intersection of Quaker Road and Dix Avenue:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam; moderate fine granular structure; very friable; many fine roots; 3 percent coarse fragments; neutral; abrupt smooth boundary.

B21—9 to 17 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; many fine roots; 3 percent coarse fragments; mildly alkaline; gradual smooth boundary.

B22—17 to 28 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; few fine roots; 3 percent coarse fragments; mildly alkaline; clear wavy boundary.

C—28 to 30 inches; grayish brown (10YR 5/2) loam; massive; friable; few fine roots; 5 percent coarse fragments; moderately alkaline.

R—30 inches; gray (N 5/0) limestone bedrock.

The solum ranges from 18 to 30 inches in thickness. Depth to bedrock is 20 to 40 inches. Coarse fragments make up 0 to 15 percent, by volume, of the surface layer, 3 to 35 percent of the subsoil, and 5 to 60 percent of the substratum. Reaction ranges from moderately acid to neutral in the A horizon, moderately acid to mildly alkaline in the B horizon, and mildly alkaline or moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 3 to 4, and chroma of 2 or 3. Fine earth fraction is silt loam or loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. Faint or distinct mottles that have chroma of more than 2 are in the lower part of some pedons. Fine earth fraction in the B horizon is silt loam, loam, or fine sandy loam.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. Fine earth fraction is silt loam, loam, or fine sandy loam.

The bedrock is limestone or dolomitic limestone.

Greenwood Series

The Greenwood series consists of very poorly drained soils in depressions on uplands. These soils formed in organic deposits more than 51 inches thick. Slope ranges from 0 to 2 percent.

Greenwood soils formed in organic parent material similar to that of and are occasionally near Cathro soils. Greenwood soils are commonly near poorly drained mineral Lyme soils and Saprists and Aquepts.

Typical pedon of Greenwood muck, in an area of Cathro and Greenwood mucks, in the town of Chester, 200 feet west of I-87 and 2 miles north of intersection with NY Route 8:

Oi—0 to 14 inches; dark brown (7.5YR 3/2) broken face, reddish brown (5YR 4/4) rubbed fibric material; about 95 percent fibers, about 90 percent rubbed; massive; mainly sphagnum moss and roots; extremely acid; clear wavy boundary.

Oe1—14 to 28 inches; dark reddish brown (5YR 3/2) broken face and rubbed hemic material; about 40 percent fibers, about 20 percent rubbed; massive; mainly herbaceous fibers; extremely acid; gradual wavy boundary.

Oe2—28 to 48 inches; dark reddish brown (5YR 3/2) broken face and rubbed hemic material; about 60 percent fibers, about 40 percent rubbed; massive; mainly herbaceous fibers; extremely acid; gradual wavy boundary.

Oa2—48 to 69 inches; dark brown (7.5YR 3/2) broken face and rubbed hemic material; about 30 percent fibers, about 10 percent rubbed; massive; mainly herbaceous fibers; extremely acid; gradual wavy boundary.

Oa4—69 to 80 inches; dark reddish brown (5YR 3/2) broken face, dark brown (7.5YR 3/2) rubbed hemic material; about 60 percent fibers, about 10 percent rubbed; massive; primarily herbaceous fibers; extremely acid.

The organic material is more than 51 inches thick. The surface tier is commonly fibric material derived from spagnum moss. The subsurface and bottom tiers are dominantly hemic material derived from sphagnum moss and other herbaceous plants. The Oe horizon has hue of 5YR or 7.5YR, value of 2 or 3, and chroma of 2. Reaction is extremely acid.

Hartland Series

The Hartland series consists of deep, well drained soils on terraces or lake plains. Slope ranges from 3 to 15 percent.

Hartland soils are in a drainage sequence with moderately well drained Belgrade soils and poorly drained Raynham soils. They are near sandy Oakville and Plainfield soils and loamy Agawam soils, but have a higher silt content than these soils.

Typical pedon of Hartland very fine sandy loam, 3 to 8 percent slopes, in the town of Queensbury, 0.3 mile south of the junction of Tee Hill Road and Moon Hill Road, 100 yards east of Tee Hill Road:

Ap—0 to 8 inches; dark brown (10YR 4/3) very fine sandy loam; weak fine and medium granular structure; very friable; many fine and medium roots; moderately acid; clear wavy boundary.
B21—8 to 16 inches; yellowish brown (10YR 5/6) very fine sandy loam; weak fine and medium granular structure; very friable; common fine and medium roots; strongly acid; clear wavy boundary.
B22—16 to 21 inches; brownish yellow (10YR 6/6) very fine sandy loam; weak fine granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.
C1—21 to 38 inches; brownish yellow (10YR 6/6) very fine sandy loam; massive; very friable; few fine roots; moderately acid; gradual, smooth boundary.
C2—38 to 60 inches; light olive brown (2.5Y 5/4) very fine sandy loam; very friable; moderately acid.

The solum ranges from 14 to 33 inches in thickness. In some pedons coarse fragments make up 0 to as much as 3 percent, by volume, of some layers. Reaction ranges from strongly acid to neutral throughout.

The A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. It is silt loam, silt, or very fine sandy loam.

The B horizon or the upper part has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. In the lower part it has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 2 to 8. It is silt loam, silt, or very fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 to 6. It is silt loam, silt, or very fine sandy loam. In some pedons it has varves.

Hermon Series

The Hermon series consists of deep, well drained or somewhat excessively drained soils on mountainsides and hilltops on uplands. Slope ranges from 3 to 45 percent.

Hermon soils are near Marlow, Paxton, Charlton, and Lyman soils. Hermon soils do not have the fragipan that Marlow and Paxton soils have, are in higher and colder positions than Charlton soils, and are deeper to bedrock than shallow Lyman soils.

Typical pedon of Hermon gravelly fine sandy loam, in an area of Hermon very bouldery fine sandy loam, sloping, in the town of Johnsburg, at the northeast corner of the intersection of Garnet Hill Road and 4-H Road:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) gravelly fine sandy loam; weak fine subangular blocky structure; very friable; many fine roots; 15 percent coarse fragments; strongly acid, clear smooth boundary.
B21hir—5 to 12 inches; dark reddish brown (5YR 3/3) gravelly fine sandy loam; weak fine subangular blocky structure; friable; many fine roots; 20 percent coarse fragments; strongly acid; clear wavy boundary.
B22ir—12 to 18 inches; dark brown (7.5YR 4/4) gravelly fine sandy loam; weak fine and medium subangular blocky structure; friable; common fine roots; 25 percent coarse fragments; strongly acid; clear smooth boundary.
B23—18 to 25 inches; yellowish brown (10YR 5/4) very gravelly sandy loam; moderate fine and medium subangular blocky structure; friable; few fine roots; 40 percent coarse fragments; strongly acid; clear wavy boundary.
C—25 to 60 inches; grayish brown (2.5Y 5/2) very gravelly loamy sand; massive; firm; 40 percent coarse fragments; strongly acid.

The solum ranges from 15 to 35 inches in thickness. The A horizon is extremely acid to strongly acid, the B horizon is extremely acid to moderately acid, and the C horizon is strongly acid or moderately acid. Coarse fragments make up 5 to 50 percent, by volume, of the uppermost 10 inches and 15 to 60 percent of individual horizons below a depth of 10 inches.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon, where present, has hue of 5YR to 2.5Y, value of 5 to 7, and chroma of 1 or 2. The A horizon is sandy loam, fine sandy loam, coarse sandy loam, or their gravelly analog.

The B21hir horizon has hue of 2.5YR to 7.5YR, value of 3 or 4, and chroma of 2 to 8. The B22ir horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 3 to 8. The B21hir and B22ir horizons are coarse sandy loam, fine sandy loam, sandy loam, or their gravelly, very gravelly, or extremely gravelly analog. Consistence is friable or very friable.

The B23 horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 3 to 8. The B3 horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. These horizons are gravelly, very gravelly, or extremely gravelly coarse sandy loam or sandy loam. Consistence is loose to firm. In some pedons the B22ir and B23 horizons have discontinuous cementation.

The C horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 to 4. It is gravelly, very gravelly, or

extremely gravelly coarse sand, sand, or loamy sand. Consistence is loose to firm.

Hermon soils in this survey area are taxadjuncts to the Hermon series because there is less sand in the B horizon than defined for the range in the series. This difference does not affect use and management of the soils.

Hinckley Series

The Hinckley series consists of deep, excessively drained soils on terraces, outwash plains, deltas, kames, and eskers. These soils formed in gravelly, water-sorted deposits. Slope ranges from 0 to 45 percent.

Hinckley soils are in a drainage sequence with moderately well drained Castile soils and somewhat poorly drained or poorly drained Wareham soils. Hinckley soils are commonly near sandy Oakville and Plainfield soils but have a higher gravel content than these soils.

Typical pedon of Hinckley cobbly sandy loam, 3 to 8 percent slopes, in the town of Thurman, 2,000 feet north of intersection of Buyce Cross Road and River Road, 100 feet east of River Road, in a gravel pit:

O1—1/2 inch to 0; dark brown (10YR 3/3) undecomposed leaf litter.

A1—0 to 4 inches; very dark gray (10YR 3/1) cobbly sandy loam; weak fine granular structure; very friable; many fine roots; 15 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—4 to 11 inches; dark brown (7.5YR 4/4) very gravelly loamy sand; weak fine granular structure; very friable; many fine roots; 50 percent coarse fragments; strongly acid; abrupt smooth boundary.

B22—11 to 21 inches; dark brown (7.5YR 4/4) very gravelly loamy sand; weak fine granular structure; very friable; many fine roots; 40 percent coarse fragments; strongly acid; abrupt smooth boundary.

B3—21 to 27 inches; dark yellowish brown (10YR 4/4) gravelly sand; weak medium subangular blocky structure; very friable; few fine and medium roots; 25 percent coarse fragments; strongly acid; abrupt wavy boundary.

C1—27 to 49 inches; light olive brown (2.5Y 5/4) stratified very gravelly sand; single grain; loose; few fine roots; 70 percent coarse fragments; moderately acid; abrupt wavy boundary.

C2—49 to 63 inches; light olive brown (2.5Y 5/4) stratified very gravelly sand; single grain; loose; 35 percent coarse fragments; moderately acid.

The solum ranges from 12 to 30 inches in thickness. Coarse fragments make up 15 to 35 percent, by volume, of the surface layer, 10 to 60 percent of the subsoil, and 30 to 70 percent of the substratum. In unlimed areas reaction is extremely acid to moderately acid throughout.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It ranges from loamy coarse sand to very fine sandy loam, and includes their cobbly or gravelly analogs.

The B horizon in the upper part has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. In the lower part it has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Texture of the B2 horizon within 10 inches of the surface ranges from fine sandy loam to loamy coarse sand and includes their gravelly or very gravelly analogs. Below a depth of 10 inches it ranges from loamy fine sand to very gravelly loamy coarse sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 2 to 8. It ranges from very gravelly loamy fine sand to cobbly coarse sand, and is generally stratified. Some pedons have thin lenses of gravel-free soil.

Hudson Series

The Hudson series consists of deep, moderately well drained soils on lake plains and side slopes of dissected ridges. These soils formed in lacustrine deposits that have a high content of silt and clay. Slope ranges from 3 to 15 percent.

Hudson soils are in a drainage sequence and are near somewhat poorly drained Rhinebeck soils and poorly drained and very poorly drained Madalin soils.

Typical pedon of Hudson silt loam, 3 to 8 percent slopes, in the town of Queensbury, 1,850 feet east of intersection of NY Route 91 and Hicks Road, 900 feet south of Hicks Road:

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable; slightly sticky; many fine roots; neutral; clear smooth boundary.

B&A—7 to 14 inches; brown (10YR 5/3) silty clay loam; moderate fine subangular blocky structure; firm; sticky and plastic; many fine roots; pale brown (10YR 6/3) silt coats (2 mm thick) on ped faces; neutral; clear wavy boundary.

B21t—14 to 21 inches; brown (10YR 4/3) silty clay; common medium distinct yellowish brown (10YR 5/6) and grayish brown (2.5Y 5/2) mottles; moderate very coarse prismatic structure parting to strong blocky; firm, plastic and sticky; common fine roots; brown (10YR 5/3) clay films on ped faces; neutral; clear wavy boundary.

B22t—21 to 30 inches, brown(10YR 5/3) silty clay; common distinct yellowish brown (10YR 5/6) mottles; strong coarse subangular blocky structure; firm, slightly sticky and plastic; few fine roots; mildly alkaline; clear wavy boundary.

C—30 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium platy structure; firm, slightly sticky and plastic; slightly effervescent; mildly alkaline.

The solum ranges from 20 to 48 inches in thickness. Coarse fragments make up 0 to 5 percent of the volume throughout. Reaction ranges from slightly acid to neutral in the surface layer, from moderately acid to mildly alkaline in the subsoil, and from neutral to moderately alkaline in the substratum.

The Ap or A1 horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. It is silt loam to silty clay loam. The A2 horizon, where present, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 or 3.

The B&A horizon has characteristics of the B2t horizon in the B part and of the A2 horizon in the A part.

The Bt horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. It is silty clay loam or silty clay and ranges to clay in the lower part of some pedons. Some pedons have a B3 horizon that contains free carbonates.

The C horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 3. It is silt loam to clay.

Lyman Series

The Lyman series consists of shallow, somewhat excessively drained, gently sloping to steep soils on rocky hillsides, hilltops, and ridges in mountainous, upland areas. Depth to bedrock ranges from 8 to 20 inches. Slope ranges from 3 to 45 percent.

Lyman soils are near Hermon, Stowe, Bice, and Marlow soils. All of these soils are more than 40 inches deep to bedrock. Stowe and Marlow soils have a firm, compact substratum.

Typical pedon of Lyman fine sandy loam, in an area of Lyman-Rock outcrop complex, steep, in the town of Johnsburg, about 6.75 miles northeast of the Warren County-Hamilton County line, 1,300 feet southeast of NY Route 8, in a wooded area:

O1—2 inches to 0; partly decomposed forest litter.
A1—0 to 2 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent coarse fragments; strongly acid; clear smooth boundary.
B21h—2 to 4 inches; dark reddish brown (2.5YR 2/4) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 10 percent coarse fragments; moderately acid; clear smooth boundary.
B22ir—4 to 8 inches; reddish brown (5YR 4/4) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; 10 percent coarse fragments; moderately acid; clear smooth boundary.
B23—8 to 17 inches; brown (7.5YR 5/4) fine sandy loam; weak fine granular structure; friable; common fine roots; 10 percent coarse fragments; dark reddish brown (2.5YR 3/4) at bedrock contact; strongly acid; abrupt smooth boundary.
R—17 inches; granitic bedrock.

The solum thickness and depth to bedrock range from 8 to 20 inches. Coarse fragments make up 5 to 35 percent, by volume, of the solum. Reaction ranges from extremely acid to moderately acid throughout.

The A1 horizon is neutral or has hue of 5YR to 10YR, value of 2 or 3, and chroma of 0 to 2. It is sandy loam, fine sandy loam, very fine sandy loam, silt loam, or their gravelly or channery analog.

The B21h horizon has hue of 2.5YR to 10YR, value of 2 to 4, and chroma of 2 to 6. The B22ir horizon has hue of 2.5YR to 10YR, value of 3 or 4, and chroma of 3 to 8. The B23 horizon has hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 3 or 4. The B horizon is sandy loam, fine sandy loam, loam, silt loam, or their gravelly or channery analog.

The R horizon is mostly granitic bedrock.

Lyme Series

The Lyme series consists of deep, poorly drained soils in upland depressions. These soils formed in glacial till. Slope ranges from 0 to 8 percent.

Lyme soils are in a drainage sequence with well drained Bice soils and moderately well drained Schroon soils. They are commonly near Paxton and Woodbridge soils but do not have the firm, brittle C horizon of these soils. Lyme soils are not as sandy as the nearby Wareham soils.

Typical pedon of Lyme fine sandy loam, 0 to 3 percent slopes, in the town of Chester, 660 feet north of the junction of Igernia Road and Perry Road and 80 feet west of Perry Road:

O2—2 inches to 0; black (5YR 2/1) decomposed forest litter.
A1—0 to 8 inches; black (10YR 2/1) fine sandy loam; weak fine and medium granular structure; friable; many fine roots; 14 percent coarse fragments; strongly acid; clear wavy boundary.
B21g—8 to 11 inches; dark grayish brown (10YR 4/2) fine sandy loam; common fine distinct reddish brown (5YR 4/4) mottles; weak fine and medium granular structure; friable; common fine roots; 12 percent coarse fragments; strongly acid; clear wavy boundary.
B22—11 to 20 inches; dark yellowish brown (10YR 4/4) fine sandy loam; many medium and coarse prominent yellowish red (5YR 4/6) and dark reddish brown (2.5YR 3/4) mottles; weak fine and medium granular structure; friable; few fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.
B23—20 to 25 inches; dark grayish brown (2.5Y 4/2) sandy loam; many coarse prominent yellowish red (5YR 4/6) mottles; weak fine and medium granular structure; friable; 10 percent coarse fragments; strongly acid; clear wavy boundary.

C—25 to 60 inches; grayish brown (2.5Y 5/2) fine sandy loam; many coarse prominent yellowish red (5YR 4/6) and grayish brown (10YR 5/2) mottles; massive; friable; 10 percent coarse fragments; strongly acid.

The solum ranges from 20 to 36 inches in thickness. Coarse fragments range from 5 to 15 percent, by volume, in the surface layer, 5 to 20 percent in the subsoil, and 5 to 25 percent in the substratum. In unlimed areas reaction is very strongly acid or strongly acid.

The A1 or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Fine earth fraction is fine sandy loam, very fine sandy loam, or loam.

The B2 horizon in the upper part has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. In the lower part it has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. The B2 horizon in the fine earth fraction is fine sandy loam, loam, or sandy loam. The B2 horizon has distinct or prominent mottles that have high and low chroma colors.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It has distinct or prominent mottles that generally become less abundant with increasing depth. Fine earth fraction is fine sandy loam or sandy loam.

Madalin Series

The Madalin series consists of deep, poorly drained and very poorly drained soils in depressions on lake plains and in small basins in upland areas. These soils formed in glacial, lake-laid sediments. Slope ranges from 0 to 3 percent.

Madalin soils are in a drainage sequence with moderately well drained Hudson soils and somewhat poorly drained Rhinebeck soils.

Typical pedon of Madalin silt loam, in the town of Queensbury, approximately 1,600 feet west of intersection of County Line Road and Hicks Road, approximately 900 feet south of Hicks Road:

Ap—0 to 6 inches; very dark gray (10YR 3/1) silt loam; moderate fine and medium blocky structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

B21tg—6 to 12 inches; dark grayish brown (10YR 4/2) silty clay; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; moderate medium to coarse prismatic structure; firm, sticky and plastic; very few fine roots; thin discontinuous clay films on ped faces; neutral; clear smooth boundary.

B22tg—12 to 40 inches; gray (10YR 5/1) silty clay; common fine distinct yellowish brown (10YR 5/6) mottles; strong coarse subangular blocky structure; firm, very plastic; thin clay films on ped faces; neutral; gradual smooth boundary.

C—40 to 60 inches; gray (10YR 5/1) silty clay; massive; firm, very sticky and plastic; slightly effervescent; mildly alkaline.

The thickness of the solum and depth to carbonates range from 24 to 48 inches. Coarse fragments range from 0 to 2 percent, by volume, in the solum and from 0 to 20 percent in the substratum. Reaction ranges from strongly acid to neutral in the surface layer and from moderately acid to mildly alkaline in the subsoil.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is loam to silty clay loam. A thin, O horizon is on the surface in some pedons.

The B2 horizon has hue of 10YR and 2.5Y, value of 4 to 6, and chroma of 1 to 3. It is silty clay loam to clay. The clay content of the horizon is 35 to to 55 percent.

The C horizon has hue of 10YR, 2.5Y, 5Y, 5G, or 5GY, value of 5, and chroma of 1 or 2. It is silty clay loam to clay.

Marlow Series

The Marlow series consists of deep, well drained, gently sloping to steep soils on uplands mantled with glacial till. Slope ranges from 3 to 45 percent.

Marlow soils are in a drainage sequence with moderately well drained Peru soils. Marlow soils are near Hermon and Lyman soils. They have a dense substratum that Herman soils do not have, and are deeper to bedrock than Lyman soils.

Typical pedon of Marlow fine sandy loam, in an area of Marlow very bouldery fine sandy loam, sloping, in the town of Johnsburg, 1,000 feet southeast of Gore Mountain Ski Lodge, 400 feet east of the ski lodge parking lot, in a wooded area:

O2—2 inches to 0; black (10YR 2/1) well decomposed litter; very friable; many roots; 10 percent coarse fragments; strongly acid; abrupt smooth boundary.

A1—0 to 4 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; 10 percent coarse fragments; very strongly acid; abrupt smooth boundary.

A2—4 to 6 inches; grayish brown (10YR 5/2) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; 10 percent coarse fragments; very strongly acid; abrupt smooth boundary.

B21hir—6 to 12 inches; dark reddish brown (5YR 3/3) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; common fine roots; 30 percent coarse fragments; strongly acid; clear wavy boundary.

B22—12 to 18 inches; dark brown (10YR 4/3) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; common fine roots; 30

percent coarse fragments; strongly acid; clear wavy boundary.
B3—18 to 28 inches; olive brown (2.5Y 4/4) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few roots; 20 percent coarse fragments; moderately acid; clear wavy boundary.
Cx—28 to 60 inches; grayish brown (2.5Y 5/2) gravelly sandy loam; moderate thick platy structure; very firm, brittle; 20 percent coarse fragments; moderately acid.

The solum ranges from 18 to 36 inches in thickness. Coarse fragments make up 5 to 15 percent, by volume, of the surface layer and 5 to 30 percent of the subsoil and the substratum. Reaction is extremely acid to moderately acid throughout.

The A1 horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 4. The Ap horizon, where present, has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. The A horizon is fine sandy loam or loam.

The B horizon in the upper part has hue of 5YR or 7.5YR, value of 2 to 4, and chroma of 2 or 3. In the lower part it has hue of 10YR and 2.5Y, value of 3 to 5, and chroma of 3 to 6. The B horizon is fine sandy loam, loam, sandy loam, or their gravelly analog.

The C horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 to 4. It is sandy loam, fine sandy loam, loam, or their gravelly analog. Consistence is very firm or firm.

Massena Series

The Massena series consists of deep, somewhat poorly drained or poorly drained, nearly level soils on uplands. These soils formed in glacial till. Slope ranges from 0 to 3 percent.

Massena soils are near well drained Charlton soils and moderately well drained Sutton soils. They are commonly near Woodbridge and Wareham soils. Massena soils do not have the fragipan of Woodbridge soils and are not as sandy as Wareham soils.

Typical pedon of Massena fine sandy loam, in the town of Queensbury, 900 feet west of the intersection of Hicks and Ridge Roads:

Ap—0 to 8 inches; very dark gray (10YR 3/1) fine sandy loam; moderate fine granular structure; friable; many fine roots; 5 percent coarse fragments; moderately acid; clear wavy boundary.
B21—8 to 12 inches; grayish brown (2.5Y 5/2) fine sandy loam; common medium faint light olive brown (2.5Y 5/6) and few fine distinct strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; 8 percent coarse fragments; slightly acid; clear wavy boundary.
B22—12 to 18 inches; brown (10YR 5/3) fine sandy loam; many medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 5/8) mottles; weak fine subangular blocky structure; friable; 10 percent coarse fragments; slightly acid; clear wavy boundary.
B23—18 to 24 inches; grayish brown (2.5Y 5/2) fine sandy loam; common medium distinct brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable; 5 percent coarse fragments; neutral; clear wavy boundary.
C—24 to 60 inches; grayish brown (2.5Y 5/2) fine sandy loam; common fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; 5 percent coarse fragments; slightly effervescent; mildly alkaline.

The solum ranges from 20 to 36 inches in thickness. Coarse fragments range from 5 to 15 percent, by volume, in the surface layer, 5 to 35 percent in the subsoil, and 5 to 50 percent in the substratum. Reaction ranges from moderately acid to neutral in the solum and from neutral to moderately alkaline in the C horizon.

The A horizon has hue to 7.5YR to 2.5Y, value of 3 or 4, and chroma of 1 or 2. Fine earth fraction ranges from sandy loam to loam.

The B horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is mottled. Fine earth fraction is sandy loam, fine sandy loam, or loam.

The C horizon is similar to the B horizon in color and texture, but in some pedons has a higher gravel content.

Middlebury Series

The Middlebury series consists of deep, moderately well drained and somewhat poorly drained, loamy soils on flood plains in valleys. These soils formed in alluvial sediments. Slope ranges from 0 to 3 percent.

Middlebury soils are in a drainage sequence with well drained Tioga soils. Middlebury soils are commonly near Fluvaquents and Udifluvents, which formed in variable deposits and which are subject to frequent flooding.

Typical pedon of Middlebury fine sandy loam, in the town of Warrensburg, 30 feet from River Road, near the crossover at Horicon Avenue:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; slightly acid; abrupt smooth boundary.
B21—10 to 19 inches; brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; slightly acid; gradual smooth boundary.
B22—19 to 30 inches; olive brown (2.5Y 4/4) fine sandy loam; common medium faint grayish brown (10YR 5/2) and distinct yellowish red (5YR 4/6) mottles; weak medium prismatic structure parting to weak coarse subangular blocky; friable; few fine roots; slightly acid; clear wavy boundary.
B3—30 to 40 inches; olive brown (2.5Y 4/4) fine sandy loam; many medium faint grayish brown (10YR 5/2)

and distinct yellowish red (5YR 4/6) mottles; weak medium prismatic structure; friable; neutral; clear smooth boundary.
C—40 to 60 inches; dark yellowish brown (10YR 4/4) fine sandy loam; many medium distinct dark reddish brown (5YR 3/4) mottles; massive; friable; neutral.

The solum ranges from 15 to 40 inches in thickness. Coarse fragments range from 0 to 15 percent, by volume, in the surface layer and from 0 to 20 percent in the subsoil and the substratum. Reaction ranges from strongly acid to slightly acid in the A horizon and from moderately acid to neutral in the B and C horizons.

The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 or 3. It ranges from fine sandy loam to silt loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 or 4. It ranges from fine sandy loam to silt loam and includes their gravelly analog.

The C horizon has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 1 to 4. It has common to many, high and low chroma mottles. Fine earth fraction ranges from fine sandy loam to silt loam. Some pedons have strongly contrasting stratified sand and gravelly sand below a depth of 40 inches.

Oakville Series

The Oakville series consists of deep, well drained, sandy soils on outwash plains and deltas. Slope ranges from 0 to 45 percent.

Oakville soils are in a drainage sequence with moderately well drained Elnora soils and somewhat poorly drained and poorly drained Wareham soils. They are near, and commonly adjacent to, gravelly Hinckley soils and silty Hartland soils. They are commonly intermingled with Plainfield soils but have a higher content of fine sand than these soils.

Typical pedon of Oakville loamy fine sand, 0 to 3 percent slopes, in the town of Queensbury, 3,600 feet east of NY Route 254 and Dixon Road, 400 feet south of Dixon Road:

Ap—0 to 8 inches; dark brown (10YR 3/3) loamy fine sand; weak fine granular structure; very friable; many roots; slightly acid; abrupt smooth boundary.
B2—8 to 14 inches; yellowish brown (10YR 5/6) sand; weak medium granular structure; very friable; common roots; strongly acid; clear smooth boundary.
B3—14 to 27 inches; light olive brown (2.5Y 5/6) sand; single grain; loose; common roots; moderately acid; clear smooth boundary.
C1—27 to 45 inches; light olive brown (2.5Y 5/4) sand; single grain; loose; few roots; slightly acid; clear smooth boundary.
C2—45 to 60 inches; grayish brown (2.5Y 5/2) sand; single grain; loose; slightly acid.

The solum ranges from 20 to 36 inches in thickness. In some pedons gravel makes up 0 to about 3 percent, by volume, of the solum and about 5 percent of the substratum. Reaction ranges from strongly acid to neutral.

The Ap or A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. It is fine sand or loamy fine sand.

The B2 horizon has hue of 10YR to 7.5Y, value of 4 to 6, and chroma of 4 to 8. It is fine sand, loamy fine sand, or sand. It has granular structure, or it is single grain. Consistency is very friable or loose.

The B3 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It is loamy fine sand, sand, or fine sand.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is sand, fine sand, or loamy fine sand.

Palms Series

The Palms series consists of very poorly drained, organic soils in depressions on lake plains and till plains. These soils consist of well decomposed organic layers 16 to 51 inches thick over loamy materials. Slope ranges from 0 to 2 percent.

Palms soils are near poorly drained and very poorly drained Madalin soils and somewhat poorly drained to very poorly drained Fluvaquents. Palms soils formed partly in organic deposits, but these other soils have mineral parent material. Palms soils in many places are near Carlisle soils, but are not as deep to mineral layers as these soils.

Typical pedon of Palms muck, in the town of Queensbury, 25 feet south of Sanford Street, 1,050 feet west of the junction of Sanford Street and Quaker Road:

Oa1—0 to 10 inches; black (10YR 2/1) muck (sapric material); 8 percent fiber rubbed; weak medium granular structure; slightly sticky; many fine and medium roots; slightly acid; abrupt smooth boundary.
Oa2—10 to 25 inches; black (N2/0) muck (sapric material); 5 percent fiber rubbed; massive; slightly sticky; few fine roots; neutral; abrupt smooth boundary.
IICg—25 to 60 inches; gray (5Y 6/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; massive; sticky; neutral.

The organic material ranges from 16 to 50 inches in thickness. It is partly decomposed to completely decomposed herbaceous plant material. The organic layers are strongly acid to mildly alkaline, and the mineral substratum is slightly acid or moderately alkaline.

The surface tier is neutral or has hue of 7.5YR or 10YR, value of 2, and chroma of 0 to 2. It is sapric or hemic material.

The subsurface and bottom tiers are neutral or have hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. It is sapric material that has as much as 50 percent mineral material, by volume.

The IICg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It is fine sandy loam, clay loam, or silty clay loam that has as much as 15 percent coarse fragments, by volume.

Paxton Series

The Paxton series consists of deep well drained soils on uplands. They have a firm, compact layer at a depth of 18 to 36 inches. Slope ranges from 3 to 15 percent.

Paxton soils are in a drainage sequence with moderately well drained Woodbridge soils. Paxton soils are near well drained Charlton soils and moderately well drained Sutton soils. Charlton and Sutton soils do not have a firm, compact layer like that of Paxton soils.

Typical pedon of Paxton fine sandy loam, 3 to 8 percent slopes, in town of Queensbury, 1/4 mile north-northeast of junction of Chestnut Ridge Road and Ridge Road, 150 feet west of Chestnut Ridge Road:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; 5 percent coarse fragments; moderately acid; clear smooth boundary.

B21—10 to 19 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; friable; many fine roots; 5 percent coarse fragments; moderately acid; clear smooth boundary.

B22—19 to 31 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak fine and medium subangular blocky structure; friable; common fine roots; 8 percent coarse fragments; moderately acid; clear smooth boundary.

Cx—31 to 60 inches; grayish brown (2.5Y 5/2) fine sandy loam; weak medium platy structure; firm; 12 percent coarse fragments; moderately acid.

The solum ranges from 18 to 36 inches in thickness. Coarse fragments range from 5 to 15 percent, by volume, in the surface layer, 5 to 25 percent in the subsoil, and 10 to 30 percent in the substratum. Reaction ranges from very strongly acid to moderately acid throughout.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. Fine earth fraction is loam, fine sandy loam, or sandy loam. Unplowed areas commonly have a thin A1 horizon and a light-colored A2 horizon.

The B2 horizon in the upper part has hue of 10YR, value of 4 or 5, and chroma of 4 to 8. In the lower part it has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 3 to 6. Fine earth fraction of the B2 horizon is fine sandy loam, sandy loam, or loam.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma 2 to 4. Fine earth fraction is fine sandy loam, loam, or sandy loam. Structure ranges from weak to strong, medium or thick platy. Consistence is firm or very firm.

Peru Series

The Peru series consists of deep, moderately well drained, gently sloping soils on uplands. These soils formed in glacial till deposits. They have a firm, compact layer at a depth of 12 to 36 inches. Slope ranges from 3 to 8 percent.

Peru soils are near well drained Marlow soils and poorly drained Lyme soils.

Typical pedon of Peru loam in an area of Peru very bouldery loam, gently sloping, in the town of Johnsburg, approximately 700 yards south of intersection of Old Farm Road and 4H Road, 75 yards west of Old Farm Road:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine roots; 5 percent coarse fragments; moderately acid; clear smooth boundary.

B21hir—8 to 16 inches; dark reddish brown (5YR 3/2) fine sandy loam; few medium faint dusky red (2.5YR 3/2) mottles in lower part; weak fine subangular blocky structure; friable; common fine roots; 5 percent coarse fragments; moderately acid; clear smooth boundary.

B22ir—16 to 23 inches; dark reddish brown (5YR 3/4) fine sandy loam; common fine faint dusky red (2.5YR 3/2) mottles; moderate fine subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; clear smooth boundary.

B3—23 to 28 inches; dark yellowish brown (10YR 4/4) fine sandy loam; common medium distinct dusky red (2.5YR 3/2) mottles; moderate fine subangular blocky structure; friable; 7 percent coarse fragments; strongly acid; clear smooth boundary.

Cx—28 to 60 inches; dark grayish brown (2.5Y 4/2) sandy loam; common fine distinct dark grayish brown (10YR 4/2) mottles; massive; very firm; 10 percent coarse fragments; strongly acid.

Solum thickness and depth to the fragipan range from 12 to 36 inches. Depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to moderately acid throughout. Texture is loam, fine sandy loam, or sandy loam, or, in the subsoil and the substratum, their gravelly analog. Coarse fragments range from 5 to 15 percent, by volume, in the surface layer and 5 to 25 percent in the subsoil and the substratum.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. A discontinuous A2 horizon is in some

undisturbed pedons, but is not common in cultivated pedons.

The B21hir horizon has hue of 5YR, value of 2 or 3, and chroma of 1 or 2. The B22ir horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 3 or 4.

The B3 horizon has hue of 10YR to 5Y, value of 4, and chroma of 3 or 4.

The C horizon has hue of 2.5Y or 5Y, value of 4 to 6, and chroma of 2 to 4. Structure is weak or moderate, thin or medium platy, or strong thick platy, or the soil is massive. Consistence is firm or very firm.

Plainfield Series

The Plainfield series consists of deep, excessively drained soils on outwash plains and stream terraces. These soils formed in sandy outwash deposits. Slope ranges from 0 to 45 percent.

Plainfield soils are in a drainage sequence with well drained Oakville soils, moderately well drained Elnora soils, and somewhat poorly drained and poorly drained Wareham soils. They are near, commonly intermingled with, but not as gravelly as Hinckley soils.

Typical pedon of Plainfield loamy sand, 0 to 3 percent slopes, in the town of Warrensburg, 100 feet east of U.S. Route 9, and 2,000 feet north of County Route 28:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine granular structure; very friable, many fine roots; moderately acid; abrupt smooth boundary.

B21—10 to 20 inches; yellowish brown (10YR 5/6) sand; single grain; loose; common fine roots; 2 percent coarse fragments; slightly acid; clear smooth boundary.

B22—20 to 25 inches; yellowish brown (10YR 5/4) sand; single grain; loose; few roots; 2 percent coarse fragments; slightly acid; clear smooth boundary.

C1—25 to 37 inches; light brownish gray (2.5Y 6/2) sand; single grain; loose; slightly acid; clear smooth boundary.

C2—37 to 60 inches; light brownish gray (10YR 6/2) sand; single grain; loose; 5 percent coarse fragments; slightly acid.

The solum ranges from 25 to 30 inches in thickness. Depth to bedrock is more than 60 inches. In some pedons gravel content ranges from 0 to 15 percent, by volume. Reaction is strongly acid to neutral in the solum and strongly acid to slightly acid in the substratum.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is loamy sand or sand.

The B horizon has hue of 10YR, value of 4 to 7, and chroma of 3 to 6. It is sand or coarse sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is sand or coarse sand.

Raynham Series

The Raynham series consists of deep, poorly drained soils on lake plains and stream terraces. These soils formed in lacustrine deposits or stream deposits. Slope ranges from 0 to 3 percent.

Raynham soils are in a drainage sequence with well drained Hartland soils and moderately well drained Belgrade soils. Raynham soils are near moderately well drained Hudson soils and somewhat poorly drained Rhinebeck soils, but are not as clayey as these soils.

Typical pedon of Raynham silt loam, in the town of Queensbury, 150 feet south of Walker Lane and 900 feet west of Bay Road:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable; common medium roots; neutral; abrupt wavy boundary.

B21—8 to 16 inches; light yellowish brown (2.5Y 6/4) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; slightly firm in place; neutral; clear smooth boundary.

B22—16 to 25 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; neutral; clear smooth boundary.

C1—25 to 35 inches; brown (10YR 5/3) very fine sandy loam; fine; few fine faint yellowish brown (10YR 5/6) mottles; weak thin platy structure; friable; neutral; clear smooth boundary.

C2—35 to 60 inches; brown (10YR 5/3) silt loam; few fine faint yellowish brown (10YR 5/6) mottles; weak thin platy structure; friable, firm in place; neutral.

The solum ranges from 16 to 37 inches in thickness. Depth to bedrock is more than 60 inches. Coarse fragments range from 0 to 2 percent, by volume. Reaction ranges from strongly acid to neutral in the solum and from moderately acid to mildly alkaline in the substratum.

The Ap horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 3. It ranges from silt loam to very fine sandy loam.

The B horizon has hue of 10YR to 5Y, value or 4 to 6, and chroma of 2 to 4. It is silt loam, silt, or very fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. It is silt loam, silt, or very fine sandy loam, and has thin layers of silt, very fine sand, or fine sand. Structure is platy, or the soils are massive.

Rhinebeck Series

The Rhinebeck series consists of deep, somewhat poorly drained soils on lake plains. These soils formed in

clayey lacustrine deposits. Slope ranges from 0 to 8 percent.

Rhinebeck soils are in a drainage sequence with moderately well drained Hudson soils and poorly drained to very poorly drained Madalin soils. Rhinebeck soils are commonly near Hartland, Belgrade, and Raynham soils, but have a higher clay content than these soils.

Typical pedon of Rhinebeck silt loam, 0 to 3 percent slopes, in the town of Queensbury, 1,850 feet east of intersection of NY Route 9L and Hicks Road, 350 feet south of Hicks Road:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam; moderate fine granular structure; friable, slightly sticky; many fine roots; neutral; abrupt smooth boundary.

B21t—8 to 17 inches; brown (10YR 5/3) silty clay loam; common fine and medium faint brown (7.5YR 5/4) and strong brown (7.5YR 5/6) mottles, moderate fine and medium subangular blocky structure; friable, slightly sticky, plastic; thin clay films on ped faces; common fine roots; neutral; clear wavy boundary.

B22—17 to 28 inches; grayish brown (10YR 5/2) silty clay loam; common fine and medium faint yellowish brown (10YR 5/6) mottles in the upper part grading to coarse in the lower part; weak to moderate coarse prismatic structure parting to moderate fine medium subangular blocky; firm, slightly sticky, plastic; thin clay films on peds; few fine roots; mildly alkaline; clear smooth boundary.

C1—28 to 42 inches; dark gray (10YR 4/1) silty clay loam; common medium faint yellowish brown (10YR 5/4 and 5/6) mottles; weak thin platy structure; firm, slightly sticky, plastic; slightly effervescent; mildly alkaline; abrupt smooth boundary.

C2—42 to 60 inches; dark gray (10YR 4/1) varved silt and clay; common fine and medium faint yellowish brown (10YR 5/6) mottles; weak thin platy structure; firm, slightly sticky, plastic; slightly effervescent; mildly alkaline.

The solum ranges from 21 to 32 inches in thickness. Depth to bedrock is more than 60 inches. Depth to carbonates ranges from 21 to 60 inches. Coarse fragments are not commonly in these soils, but in some pedons range to 15 percent, by volume, in the surface layer and to 10 percent in the subsoil and the substratum. Reaction ranges from strongly acid to neutral in the surface layer, from strongly acid to mildly alkaline in the subsoil, and from moderately acid to moderately alkaline in the substratum.

The Ap or A1 horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2. It is silt loam or silty clay loam. Some pedons have an A2 horizon.

The B2 horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 or 3. It has common or many mottles. It is silty clay loam or silty clay.

The C horizon has hue of 5YR to 5Y, value of 3 to 5, and chroma of 1 to 4. It is mainly silty clay loam to clay, and has subhorizons or varves of fine sand, silt, silty clay, or clay. Some pedons do not have free carbonates in the upper part of the C horizon.

Saprists

Saprists consist of deep, very poorly drained, organic soils commonly adjacent to natural or manmade lakes, ponds, and bodies of open water. These soils are at both high and low elevations in the survey area. They formed in black, well decomposed, herbaceous and woody plant remnants. They are ponded with shallow water throughout much of the year.

Saprists are near Aquepts, which formed in mineral soil deposits. Also, they are commonly near mineral Massena and Madalin soils and organic Palms, Carlisle, Cathro, and Greenwood soils.

Saprists are variable; therefore, a typical pedon is not given. In the uppermost layer they are well decomposed organic material more than 16 inches thick. The underlying material ranges from silty clay to gravelly loamy sand. In places bedrock underlies the organic material. Although these soils are ponded for much of the year, the water table fluctuates and thus allows aerobic decomposition of the organic matter.

The organic material has hue of 5YR, value of 2 or 3, and chroma of 0 to 2. It is well decomposed woody or herbaceous plant remnants that has less than 15 percent fibers after rubbing. Reaction is strongly acid to neutral.

Schroon Series

The Schroon series consists of deep, moderately well drained soils on uplands mostly at elevations between 1,000 and 1,500 feet. These soils formed in glacial till deposits. Slope ranges from 0 to 8 percent.

Schroon soils are in a drainage sequence with well drained Bice soils and poorly drained Lyme soils. Schroon soils are near well drained Hermon, Marlow, and Stowe soils. They do not have a dense substratum like that in Marlow and Stowe soils.

Typical pedon of Schroon gravelly fine sandy loam, 3 to 8 percent slopes, in the town of Thurman, 0.5 mile south of the intersection of Dippikill and Glen Creek Roads, 125 feet south of Dippikill Road, in a wooded area:

O2—2 inches to 0; duff.

A1—0 to 4 inches; very dark gray (10YR 3/1) gravelly fine sandy loam; moderate fine and medium granular structure; very friable; many medium and coarse roots; 25 percent coarse fragments; strongly acid; clear irregular boundary.

B21—4 to 5 inches; dark brown (10YR 4/3) gravelly fine sandy loam; weak medium subangular blocky structure; friable; many medium and coarse roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.
B22—5 to 11 inches; brown (10YR 4/3) gravelly fine sandy loam; weak medium subangular blocky structure; friable; common medium roots; 30 percent coarse fragments; strongly acid; clear wavy boundary.
B23—11 to 25 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam; few fine faint brownish yellow (10YR 6/6) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; common medium roots; 20 percent coarse fragments; strongly acid; clear wavy boundary.
C—25 to 60 inches; olive (5Y 5/3) gravelly coarse sandy loam; common medium and coarse distinct reddish brown (5YR 4/4) and light reddish brown (5YR 6/4) mottles; massive; firm; 20 percent coarse fragments; strongly acid.

The solum ranges from 20 to 36 inches in thickness. Depth to bedrock is commonly more than 72 inches. Rock fragments range from 15 to 30 percent, by volume, in the surface layer and from 5 to 35 percent throughout the rest of the soils. As much as 25 percent of the fragments are more than 3 inches in diameter. Reaction ranges from very strongly acid to moderately acid in the solum and from strongly acid to slightly acid in the C horizon, and is slightly acid strictly below a depth of more than 30 inches.

The A horizon has hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 1 or 2. Plowed soils have value and chroma of 1 or 2 units higher. Fine earth fraction is sandy loam, fine sandy loam, or loam.

The B horizon has hue of 5YR to 10YR, or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is distinctly mottled. Fine earth fraction is fine sandy loam, sandy loam, or loam. Consistence is very friable or friable.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It is mottled. Fine earth fraction is fine sandy loam, sandy loam, or coarse sandy loam. Thin lenses of silt loam or loamy sand are in some pedons. The horizon is massive or has weak platy structure. Consistence is friable to firm.

Shaker Series

The Shaker series consists of deep, poorly drained soils on lake plains or deltas. These soils formed in a thin mantle of loamy deposits over clayey lacustrine sediment. Slope ranges from 0 to 3 percent.

Shaker soils are in a drainage sequence with moderately well drained Elmridge soils. They are near Raynham and Wareham soils, which do not have as high a clay content in the substratum as Shaker soils.

Typical pedon of Shaker fine sandy loam, in the town of Queensbury, at Adirondack Community College, 75 yards east of the student parking lot, and 0.5 mile south of the intersection of Haviland and Bay roads, in an area of grass:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; common fine roots; slightly acid; abrupt smooth boundary.
B21—10 to 14 inches; grayish brown (10YR 5/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; neutral; clear smooth boundary.
B22—14 to 36 inches; grayish brown (2.5Y 5/2) sandy loam; many medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak fine granular structure; very friable; neutral; clear smooth boundary.
IIC—36 to 60 inches; gray (5Y 5/1) silty clay; many medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; neutral.

The solum ranges from 18 to 36 inches in thickness. Coarse fragments generally are not in the soils, but in some pedons range to as much as 3 percent. Reaction is strongly acid to neutral in the loamy upper mantle and moderately acid to neutral in the clayey substratum.

The A horizon has hue of 7.5YR and 10YR, value of 2 to 4, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. It has distinct or prominent mottles. It is fine sandy loam, sandy loam, or loam.

The C horizon has hue of 2.5Y to 5Y, value of 4 or 5, and chroma of 1 to 3. It is silty clay loam to clay.

Stowe Series

The Stowe series consists of deep, well drained and moderately well drained soils on uplands. These soils formed in glacial till. They have a firm, compact layer at a depth of 16 to 33 inches. Slope ranges from 3 to 45 percent.

Stowe soils are near well drained Hermon, Marlow, Bice, and Woodstock soils. Stowe soils are at lower elevations than Hermon and Marlow soils, generally less than 1,500 feet in elevation, and have a fragipan, which Hermon and Bice soils do not have. Stowe soils are deeper to bedrock than Woodstock soils.

Typical pedon of Stowe fine sandy loam, 8 to 15 percent slopes, in town of Horicon, 2,200 feet west of the intersection of Jim Younes and Duell Hill Roads, 390 feet south of the end of Jim Younes Road:

Ap—0 to 8 inches; dark brown (10YR 3/3) fine sandy loam; moderate fine granular structure; friable; many fine roots; 5 percent coarse fragments; moderately acid; abrupt smooth boundary.
B21—8 to 12 inches; yellowish brown (10YR 5/6) fine sandy loam; moderate medium subangular blocky structure; friable; common fine roots; 10 percent coarse fragments; slightly acid; clear wavy boundary.
B22—12 to 23 inches; light olive brown (2.5Y 5/4) fine sandy loam; moderate medium subangular blocky structure; friable; common fine roots; 10 percent coarse fragments; slightly acid; clear wavy boundary.
A'2—23 to 30 inches; grayish brown (2.5Y 5/2) fine sandy loam; moderate medium platy structure; firm; few fine roots; 5 percent coarse fragments; slightly acid; clear wavy boundary.
Cx—30 to 60 inches; dark grayish brown (2.5Y 4/2) fine sandy loam; strong medium platy structure; very firm; brittle; 10 percent coarse fragments; slightly acid.

The solum ranges from 16 to 33 inches in thickness. Coarse fragments range from 5 to 15 percent, by volume, in the surface layer, from 5 to 25 percent in the subsoil, and from 5 to 35 percent in the substratum. Reaction ranges from strongly acid to neutral throughout.

The Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 2 to 4. It is loam or fine sandy loam. In some unplowed areas a broken, thin, A2 horizon underlies an A1 horizon.

In the upper part the B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. In the lower part it has hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 2 to 6. Fine earth fraction of the B2 horizon ranges from sandy loam to loam.

The A'2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2. Texture is sandy loam or fine sandy loam.

The C horizon has hue of 2.5Y or 5Y, value of 3 to 6, and chroma of 2 to 4. Fine earth fraction is fine sandy loam, sandy loam, or loam. Structure ranges from weak to strong, thin to thick platy. Consistence is firm or very firm.

Stowe soils in the survey area are taxadjuncts to the Stowe series because they do not have a spodic horizon, which is defined for the Stowe series. This difference does not affect use and management of the soils.

Sutton Series

The Sutton series are deep, moderately well drained soils in upland areas. These soils formed in glacial till. Slope ranges from 3 to 8 percent.

Sutton soils are in a drainage sequence with well drained Charlton soils and somewhat poorly drained and poorly drained Massena soils. Sutton soils are near gravelly Hinckley soils and near Paxton and Woodbridge soils, which have a firm compact layer in the substratum.

Typical pedon of Sutton fine sandy loam, 3 to 8 percent slopes, in the town of Queensbury, 0.3 mile west of the junction of Bay and Pickle Hill Roads, 300 feet south of Pickle Hill Road, in a wooded area:

O2—2 inches to 0; decomposed and partly decomposed forest litter.
A1—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent coarse fragments; moderately acid; abrupt smooth boundary.
B21—5 to 12 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; friable; common fine roots; 10 percent coarse fragments; moderately acid; clear wavy boundary.
B22—12 to 29 inches; yellowish brown (10YR 5/6) fine sandy loam; common fine and medium distinct reddish brown (5YR 4/4) and grayish brown (2.5Y 5/2) mottles; weak fine subangular blocky structure; friable; 10 percent coarse fragments; moderately acid; clear wavy boundary.
C—29 to 60 inches; olive (5Y 5/3) fine sandy loam; common fine distinct yellowish red (5YR 5/6) mottles; massive; friable; 5 percent coarse fragments; moderately acid.

The solum ranges from 20 to 36 inches in thickness. Coarse fragments range from 5 to 15 percent, by volume, in the surface layer, from 5 to 20 percent in the subsoil, and from 5 to 30 percent in the substratum. In unlimed areas reaction ranges from very strongly acid to moderately acid in the solum and from very strongly acid to slightly acid in the substratum.

The A1 and Ap horizons have hue of 7.5YR to 10YR, value of 3 or 4, and chroma of 1 to 4. Fine earth fraction of the A horizon is fine sandy loam, very fine sandy loam, or loam.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. The B22 and B23 horizons have hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 2 to 6. It is mottled. Fine earth fraction of the B2 horizon is fine sandy loam, loam, or sandy loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4. It is mottled. Fine earth fraction is dominantly fine sandy loam or sandy loam. Some pedons have thin lenses of silt loam or loamy sand.

Tioga Series

The Tioga series consists of deep, well drained soils on flood plains. These soils formed in alluvial deposits. Slope ranges from 0 to 3 percent.

Tioga soils are in a drainage sequence with moderately well drained and somewhat poorly drained Middlebury soils and somewhat poorly drained to very poorly drained Fluvaquents and Udifluvents. Tioga soils are not as sandy as nearby Oakville and Plainfield soils or as gravelly as nearby Hinckley and Castile soils.

Typical pedon of Tioga fine sandy loam, in the town of Thurman, 500 feet southwest of NY Route 418, 150 feet northwest of the Hudson River:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine and very fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B21—10 to 17 inches; dark brown (10YR 3/3) and dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; very friable; common fine roots; common pores; moderately acid; clear wavy boundary.

B22—17 to 28 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; very friable; 1/2- to 1-inch thick lenses of loamy fine sand; common fine and medium roots; moderately acid; abrupt smooth boundary.

C1—28 to 41 inches; yellowish brown (10YR 5/4) fine sandy loam; massive; very friable; few fine and medium roots; slightly acid; clear wavy boundary.

IIC2—41 to 60 inches; dark yellowish brown (10YR 4/4) loamy sand; single grain; loose; 5 percent coarse fragments; moderately acid.

The solum ranges from 18 to 40 inches in thickness. Coarse fragments make up 0 to 3 percent, by volume, of the surface layer, 0 to 35 percent of the subsoil, and 0 to 60 percent of individual layers in the substratum. Reaction is strongly acid to neutral in the solum and moderately acid to mildly alkaline in the substratum.

The A horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4. Fine earth fraction is fine sandy loam to silt loam.

The B horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4. Fine earth fraction is fine sandy loam to silt loam. Some pedons have subhorizons of sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4. Fine earth fraction is loamy sand to silt loam.

Udifluvents

Udifluvents are deep, well drained or moderatly well drained soils adjacent to streams. These soils formed in recent alluvial deposits, and are moist most of the year. They are stratified and have little or no profile development. They are subject to frequent flooding. Slope ranges from 0 to 5 percent.

Udifluvents are mapped with Fluvaquents in this survey area, and are near Tioga and Middlebury soils.

Udifluvents are highly variable; consequently, a typical pedon is not given. Below the A horizon, the soils are generally stratified, and organic carbon content decreases irregularly with depth. Depth to bedrock is generally more than 60 inches. Content of coarse fragments is generally less than 35 percent, but strata of very gravelly or sandy material are along some streams. Reaction is very strongly acid to neutral.

The A horizon is neutral or has hue of 5YR to 10YR, value of 2 to 5, and chroma of 0 to 4. It ranges from fine sandy loam to silt loam, and includes their gravelly and channery analogs.

The C horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 to 6. It ranges from fine sandy loam to silt loam, and includes their gravelly analog. It is friable to loose.

Udorthents

Udorthents consist of moderately well drained to excessively drained soils on uplands, in valleys, or on lowland plains. These soils formed in recently exposed cuts or excavations into subsoil or substratum material and in areas of manmade fills. These soils are in areas of glacial till or glacial outwash. Depth to the water table is variable. Slope ranges from 0 to 15 percent.

In most areas Udorthents resulted from exposing or mixing soil material for construction purposes.

Udorthents are highly variable and have no distinct horizons; consequently, a typical pedon is not given.

The depth of excavations or fills ranges from 3 to 25 feet. Most areas are dry, but some pits are ponded for several days after heavy rains. Rock fragments cover 0 to 50 percent of the surface.

The soils throughout have hue of 10YR to 2.5Y, value of 3 to 5, and chroma of 2 to 6. They consist of stratified or massive, sandy, gravelly, or loamy deposits. They are firm to loose. Reaction is strongly acid to mildly alkaline.

Wareham Series

The Wareham series are deep, somewhat poorly drained and poorly drained soils in depressions on sandy outwash plains, deltas, and terraces. Slope ranges from 0 to 3 percent.

Wareham soils are in a drainage sequence with excessively drained Plainfield soils, well drained Oakville soils, and moderately well drained Elnora soils. They are associated with Hinckley and Castile soils but are not as gravelly as these soils.

Typical pedon of Wareham loamy sand, in the town of Queensbury, 200 feet west of the intersection of Haviland Road and NY Route 9L (Ridge Road), 150 feet north of Haviland Road:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loamy sand; weak fine and medium granular structure; very friable; many fine roots; slightly acid; clear wavy boundary.
B—8 to 18 inches; brown (10YR 4/3) loamy fine sand; few fine distinct dark yellowish brown (10YR 3/4) and faint olive yellow (2.5Y 6/6) mottles; weak fine subangular blocky structure; friable; slightly acid; gradual wavy boundary.
C1—18 to 32 inches; gray (5Y 5/1) loamy sand; common medium distinct olive yellow (5Y 6/6) and yellowish brown (10YR 5/4) mottles; massive; very friable; slightly acid; clear smooth boundary.
C2—32 to 60 inches; olive (5Y 5/3) sand; single grain; loose; slightly acid.

The solum ranges from 10 to 30 inches in thickness. Gravel content ranges from 0 to 15 percent, by volume, in the solum and the upper part of the substratum and from 0 to 60 percent in the lower part of the substratum. Reaction ranges from extremely acid to slightly acid.

The A1 and Ap horizons are neutral or have hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 0 to 2. They are loamy sand or loamy fine sand.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 or 3. It is loamy fine sand, loamy sand, loamy coarse sand, fine sand, or sand.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 3. It is loamy sand, loamy coarse sand, sand, coarse sand, or their gravelly or very gravelly analog.

Woodbridge Series

The Woodbridge series consists of deep, moderately well drained soils on low, elongated hills and in upland areas. These soils have a firm, compact substratum. Slope ranges from 3 to 8 percent.

Woodbridge soils are in a drainage sequence with well drained Paxton soils. They are commonly near Charlton, Sutton, and Massena soils, which do not have a firm, compact layer in the substratum.

Typical pedon of Woodbridge fine sandy loam, 3 to 8 percent slopes, in the town of Queensbury, 4,200 feet northeast of Quaker Road and 500 feet northwest of NY Route 9L:

A1—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine roots; 10 percent coarse fragments; moderately acid; abrupt smooth boundary.
B21—8 to 14 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 10 percent coarse fragments; slightly acid; clear smooth boundary.
B22—14 to 23 inches; yellowish brown (10YR 5/4) fine sandy loam; common medium distinct dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; slightly acid; clear smooth boundary.
B3—23 to 29 inches; light olive brown (2.5Y 5/4) fine sandy loam; common coarse distinct dark brown (7.5YR 4/4) and gray (10YR 6/1) mottles; weak thick platy structure; few fine roots; friable; 10 percent coarse fragments; slightly acid; clear wavy boundary.
Cx—29 to 60 inches; light olive brown (2.5Y 5/4) sandy loam; common coarse distinct dark brown (7.5YR 4/4) and gray (10YR 6/1) mottles; weak thick platy structure; very firm; 10 percent coarse fragments; slightly acid.

The solum thickness and depth to the fragipan range from 18 to 38 inches. Coarse fragments make up 5 to 30 percent, by volume, of the solum and 10 to 35 percent of the substratum. Reaction ranges from very strongly acid to slightly acid throughout.

The A horizon has hue of 10YR, value of 3 to 4, and chroma of 2 or 3. Fine earth fraction ranges from loam to fine sandy loam.

The B horizon in the upper part has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. In the lower part it has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. Fine earth fraction is loam or fine sandy loam.

The C horizon has hue of 2.5Y, value of 5 or 6, and chroma of 2 to 4. Fine earth fraction ranges from loam to sandy loam. The horizon is massive, or structure is medium or thick platy.

Woodstock Series

The Woodstock series consists of shallow, excessively drained and somewhat excessively drained soils in gently sloping to steep areas on uplands mantled with glacial till. Depth to bedrock ranges from 10 to 20 inches. Slope ranges from 3 to 45 percent.

Woodstock soils are near well drained Bice, Hermon, Stowe, and Marlow soils. All these soils are deeper than 40 inches to bedrock. Unlike Woodstock soils, Stowe and Marlow soils have a firm, compact substratum. Like Woodstock soils, Hermon and Marlow soils have a frigid temperature regime.

Typical pedon of Woodstock fine sandy loam, in an area of Woodstock-Rock outcrop complex, steep, in the town of Lake George, 500 feet west of the junction of Truesdale Hill and Flat Rock Roads, 250 feet south of Truesdale Hill Road:

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—2 to 5 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.
B22—5 to 18 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots, 5 percent coarse fragments; strongly acid; abrupt smooth boundary.
R—18 inches; granite bedrock.

The thickness of the solum and depth to bedrock range from 10 to 20 inches. Coarse fragments make up 5 to 15 percent, by volume, of the surface layer and 5 to 25 percent of the subsoil. Reaction ranges from slightly acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 2 or 3. Fine earth fraction is fine sandy loam or sandy loam.

The B2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam, sandy loam, or their gravelly analog.

Some pedons have a thin B3 horizon that is similar to the B2 horizon in color and texture, but that is massive.

Woodstock soils in this survey area are taxadjuncts to the Woodstock series because they do not have a spodic horizon, which is defined for the Stowe series. However, this difference does not affect use and management of the soils.

Formation of the Soils

The first part of this section describes the factors of soil formation and relates them to the formation of soils in the survey area. The second part defines the processes of soil horizon development as they relate to soil formation in Warren County *(10, 14)*.

Factors of Soil Formation

Soils are products of weathering and other physical and chemical processes that act on parent material. The properties of the soil at any point on the earth depend on the combination of the following factors at that point: physical and chemical composition of the parent material, climate, plant and animal life, topography, and time. The relative influence of each of these factors of soil formation differs from place to place, and each factor modifies the effect of the other four factors. For example, the effects of climate and plant and animal life are influenced by topography, the nature of the parent material, and time. In some places the influence of one factor is dominant.

Parent Material

Parent material is the unconsolidated earthy mass in which soils form. It determines the mineralogical and physical composition, and contributes greatly to the chemical composition of the soil. It also influences the rate of the soil-forming processes.

Most of the soils in Warren County formed in deposits left as the result of glaciation. The most extensive parent material is glacial till. Less extensive are glaciolacustrine (lake-laid) sediments and glaciofluvial (outwash) deposits. Some soils have been forming in recent deposits of stream alluvium and in accumulations of organic matter.

Soils formed in glacial till deposits have a wide range of characteristics as a result of the heterogeneous mixture of rock and soil particles. Firm, compact horizons and substratum are common in the deeper soils. Stowe, Marlow, and Peru soils formed in deep, glacial till deposits. In some areas the till mantle is moderately deep or shallow over bedrock. Galway, Farmington, and Woodstock soils formed in these areas. The bedrock in Warren County is variable and includes slate, granite, schist, gneiss, shale, and limestone. The glacial till deposits have a high content of the local bedrock.

As the glacial ice melted, enormous quantities of melt water carried and sorted soil and rock debris. This outwash material was redeposited in layers of sand and gravel on outwash plains, terraces, kames, eskers, and deltas. Examples of soils formed in this material are Hinckley and Castile soils. These soils are commonly medium textured to coarse textured.

Many of the larger valleys at one time contained glacial lakes where glacial melt water was trapped. Most of the stone-free sediment deposited in the quiet lake waters was clayey or silty. Rhinebeck, Hudson, and Raynham soils, for example, formed in these fine textured to medium textured deposits.

In more recent times, overflowing streams have deposited fresh, dark, alluvial material on flood plains. Soils forming in this material are typically high in content of silt or fine sand, and show only weak profile development. Tioga and Middlebury soils, for example, formed in this material.

Soils that formed in organic deposits in low areas are identified as muck. Carlisle and Palms soils are mucks that formed in well decomposed remains of trees and other plants. Cathro and Greenwood soils are mucks that formed in depressions in the colder parts of the county.

Topography

The shape of the land surface, or topography, commonly called the lay of the land, slope, and the position of the land surface as related to the water table have had great influence on the formation of soils.

Soils that formed in convex sloping areas where little runoff accumulates or where runoff is moderate or rapid, generally are well drained and have a bright colored, unmottled subsoil. They are generally leached to greater depths than low-lying, wetter soils in the same general area.

In more gently sloping areas where runoff is slower, mottling in the subsoil indicates some wetness.

In level areas or slight depressions where the water table is at or near the surface for long periods, a thick, dark colored, organic surface layer and strongly mottled or grayish subsoil indicate a marked degree of wetness.

Some soils are wet because they are in a position where water accumulates and is perched above an impervious layer in the soil. Permeability of the soil material, as well as the length, steepness, and

configuration of slopes, influences the kind of soil that forms.

Local differences in soils are largely the result of differences in parent material and topography. Soils that formed in one kind of parent material but have different characteristics because of different degrees of wetness are in a drainage sequence. Table 20 shows the relationships of parent material, landscape position, and drainage of the soils in the county *(3)*.

Climate

Climate, particularly temperature and precipitation, is one of the most influential soil-forming factors. It largely determines the kind of weathering processes that occur. It also affects the growth and kind of plants and the leaching and translocation of weathered material.

Warren County has a humid, temperate climate that tends to promote the development of moderately weathered, leached soils. The average temperature increases in lowland areas and on south-facing slopes, compared to the high elevations of the Adirondack Mountains, account for the varied climate that causes differences among the soils. For more detailed information on climate, see"General Nature of the County".

Plant and Animal Life

All living organisms, including plants, animals, bacteria, and fungi, are important to soil formation. Vegetation is generally responsible for the amount of organic matter and nutrients in the soil and for the color and structure of the surface layer. Animals, such as earthworms and burrowing animals, help to keep the soil porous and permeable to air and water. Their waste products cause aggregation of soil particles and improve soil structure. Bacteria and fungi decompose vegetation, thus releasing nutrients for plant use.

Warren County was originally under native forest of northern hardwoods and pines in varying proportions. Hardwoods retard the loss of nutrients through leaching. They take up large quantities of bases, or nutrients, and return much of this material as leaf litter to the soil surface each year. In contrast, pines and other conifers do not use large amounts of nutrients. Therefore, they do not retard the leaching process as do hardwoods.

The shallow root zone in many of the soils results in a succession of windthrows, or trees blown down by the winds. Windthrows mix the soil material.

Man also influences changes that occur in soils by clearing trees, cultivating the land, adding nutrients through fertilizers, mixing some soil horizons by plowing, and causing accelerated erosion in many areas.

Time

Time is a passive but important soil-forming factor. In geological terms, the deposits in which soils formed in Warren County are relatively young. Most of the material was left after the last glacier retreated 10,000 to 15,000 years ago. All the soils, however, have not reached the same stage of profile development. The degree of profile development reflects not only the age of a soil but also the influence of other factors. Elmridge and Hudson soils appear to be younger than Bice and Hinckley soils, but this difference is caused by parent material. All have well-defined horizons. An immature soil has not had enough time for distinct horizons to form. Tioga and Middlebury soils, for example, have been forming in alluvial sediments on flood plains. They are immature because of the periodic deposition of fresh alluvium.

Processes of Soil Formation

The soil-forming factors, previously defined, and the subsequent processes of soil formation result in the formation of different layers, or soil horizons. These horizons are apparent in a vertical cut known as a soil profile. The profile extends from the surface downward into material that is little altered by soil-forming processes. Most soils contain three major horizons: the A, the B, and the C horizons *(10, 14)*.

Several processes are involved in the formation of soil horizons. They are the accumulation of organic matter, leaching of soluble salts and minerals, translocation of silicate clay minerals, reduction and transfer of iron, and formation of compact layers in the subsoil.

Organic matter accumulates as plant residue decomposes. This process darkens the surface layer and helps to form the A1 horizon. The surface layer of mineral soils in Warren County is about 3.5 percent organic matter, by weight.

For the development of distinct subsoil horizons, some of the calcium and other soluble salts must be leached so that other processes, such as translocation of clay minerals, can take place. Factors that affect leaching are the kinds of salts originally present, the rate and depth of percolation, and the texture of the soil.

One of the most important processes of soil horizon development in some of the Warren County soils is the translocation of silicate clay minerals. The content of clay minerals in a soil is determined by the parent material, but clay content varies from one horizon to another. Clay particles are moved (eluviated) downward from the A horizon and redeposited (illuviated) in the B horizon as clay films on ped faces, as linings along pores and root channels, and as coatings on some coarse fragments. Hudson soils are an example of soils where the clay content is higher in the B horizon than in the A horizon because of translocation. In some soils an A2 horizon has formed by considerable eluviation of clay minerals to the B horizon.

Reduction and transfer of iron compounds in the wetter, more poorly drained soils occur mainly in a process known as gleying. In poorly drained and very poorly drained soils, such as Raynham and Madalin

soils, the grayish subsoil indicates reduction of iron and removal and transfer of iron in solution. In moderately well drained to somewhat poorly drained soils, yellowish brown and reddish brown mottles indicate segregation of iron compounds. Oxidation and, to some extent, reduction also occurs in these soils.

Several well drained and moderately well drained soils in the county have strong brown, yellowish brown, or reddish brown subsoil horizons. These colors are mainly caused by thin coatings of iron oxides on sand and silt particles. A bright colored subsoil with iron oxide coatings is commonly termed a color B horizon. It has normally developed subangular blocky structure but contains little or no clay translocated from the overlying surface horizon. Hinckley and Agawam soils are examples of soils that have a color B horizon.

Many soils in Warren County, for example, Marlow, Stowe, and Paxton soils, have a firm, compact layer in the subsoil. This layer is very firm and brittle when moist and very hard when dry. The genesis, or development, of these horizons is not fully understood. Studies indicate that the swelling and shrinking that takes place in alternating wet and dry periods may account for the dense packing of soil particles, the low pore space, and the large prisms on gross polygonal pattern of vertical cracks evident in most firm, compact layers *(8)*. Clay, silica, and oxides of aluminum, the most likely cementing agents, cause brittleness and hardness.

Physiography and Geology

Anson S. Piper, Assistant Professor of Geology, Adirondack Community College, and Bernard S. Ellis, geologist, Soil Conservation Service, helped to prepare this section.

Warren County is on the eastern edge of New York State, and straddles the boundary of two physiographic provinces. The bulk of the county lies within the Adirondacks, and a small portion in the south-east part extends into the Hudson-Champlain lowland. The two areas are easily distinguished by their distinct differences in topography and underlying bedrock. This boundary is sharply defined along the face of the mountains by a series of high-angle, normal faults. Within the county,the Hudson-Champlain lowland is limited to the town of Queensbury and the city of Glens Falls.

The contrast in topography in the county was produced by the down-faulting of this region with respect to the mountains to the north, and the subsequent differential erosion of the softer limestone in the south. The present landforms of the lowlands are primarily caused by glaciation, and bedrock structure was a secondary influence.

The highest point in the county, at an elevation of 3,583 feet, is the top of Gore Mountain in the extreme northwest corner of the county. In the mountainous section of the county, relief commonly ranges from 1,200 to 2,500 feet. In the lowlands relief typically is less than 100 feet.

Bedrock in the Hudson-Champlain lowland is of early Palezoic age, and consists of upper Cambrian Sandstone overlain by lower Ordovician carbonates. These formations represent a sequence of sediments deposited in a sea-advancing inland over a slowly subsiding, continental margin.

The oldest formation is fine to medium grained Potsdam Sandstone. It is about 300 feet thick in the Warren County area *(7)*. The lower contact of this sandstone is an erosion surface on the preCambrian rocks and the upper contact is gradational with the overlying Ticonderoga Formation.

The Ticonderoga Formation consists of a lower dolostone unit, which is fairly uniform in nature and medium to dark gray in color. The remaining portion consists mostly of quartz sandstone-bearing dolostone and some fine to medium grained dolostone. The sandstone is almost white in color, and the dolostone is medium dark gray. Like Potsdam Sandstone this formation is of Cambrian age. It is overlain by the Whitehall Formation.

The Whitehall Formation is nearly pure dolostone and light gray in color. In the lower part it is fine-grained and a slightly darker gray in color than the upper unit, which contains some fine-grained, limestone beds. The lower part is upper Cambrian, and the upper part is lower Ordovician. The contact with the overlying Great Meadows Formation is a disconformity *(5)*.

The Great Meadows Formation was deposited in three distinct units. The lower unit, Winchell Creek Siltstone, is laminated and cross-bedded siltstone. The middle unit, Fort Edward Dolostone, contains black chert in the upper part. The third and uppermost unit, Smith Basin Limestone, is a medium dark gray, lithographic limestone.

The Fort Ann Formation appears to be the youngest Paleozoic formation in Warren County *(7)*. It is Ordovician in age, and consists of variable, interbedded, medium to dark gray limestone bedded to massive dolostone and of calcareous and dolomitic sandstone.

Within the Adirondack province the topography is much more rugged. The origin of this relief is partly structural in that there are several downfaulted blocks and many stream valleys incised into the traces of faults and joints. With the exception of a few downfaulted blocks of Paleozoic sediment, the bedrock consists of a complex of preCambrian metamorphic rocks (fig. 10), generally consisting of quartzofeldspathic gneiss overlain by a sequence of marble, quartzite, anorthosite, and several igneous intrusions.

The quartzofeldspathic gneiss typically consists of 15 to 30 percent quartz and 60 to 70 percent feldspar. If orthopyroxene is present, the rock is usually designated a charnockite.

The marble is generally coarse-grained, mainly calcite and dinopyroxene and partly variable amounts of graphite and pyrite. The quartzite, which is generally gray-white in color when fresh, weathers to dull gray and rust colored.

Anorthosite consists mainly of plagioclase feldspar. The rest is generally pyroxene and some magnetite and garnets. These rocks tend to weather toward light gray. The browner shades are caused by the presence of iron. Anorthosite is in the western part of the county at Gore Mountain (fig. 10), in the vicinity of Northwest Bay on Lake George, and in a small outcrop south of Bolton, west of Lake George *(9)*.

The geology of the Adirondacks is very complex, and many areas remain to be studied before a detailed interpretation of its structure and stratigraphy can be made.

Multiple glaciations during the Pleistocene Epoch had a major impact on the county by extensively altering the topography, soils, and drainage.

Each interval of glaciation began with the ice sheet advancing down the valleys and merging with whatever local ice that may have formed. The ice, moving through the valleys, gouged them deeper and somewhat increased the local relief, especially in areas underlain with soft bedrock, such as the marble units. As the ice gradually thickened, it overode the hilltops and reduced their elevations by rounding off the peaks and ridges. The soils, along with a considerable amount of bedrock, were stripped away and deposited elsewhere to the south as unsorted till and stratified drift (fig. 11). The ice, which was several thousand feet thick, exerted tremendous pressure on the earth's crust, causing it to sag. This effect resulted in a regional tilt to the north, and later played a major role in the development of lakes and postglacial drainage (*6*).

Toward the close of each interval, the ice gradually thinned and its edge melted back. Occasionally, this retreat halted for a brief period, and then re-advanced because of colder climatic conditions.

These hesitations in the retreat of the ice front resulted in various kinds of till deposits, which can be seen in the following places: at Pickle Hill to the east of French Mountain the till formed a drumlin; along State Route 9N at Gage Hill and Hidden Valley there is an end moraine; and in thin sheets over most of the higher areas there is a ground moraine. The dominant glacial till soils that occur in these areas are Charlton, Paxton, Bice, Stowe, Hermon, Marlow, Woodstock, and Lyman soils. Areas generally below 1,000 feet in elevation and south of Lake George have deep, well drained Charlton and Paxton soils. Areas generally between 1,000 and 1,500 feet in elevation and north of Lake George village have deep, well drained Bice and Stowe soils and shallow Woodstock soils. Areas above 1,500 feet in elevation located mainly west of the Hudson River have deep, well drained soils, such as Hermon and Marlow soils, and shallow Lyman soils. Stones, boulders, and rock outcrops are common in the last two areas.

Stratified drift was deposited as an outwash plain, complete with ice block lakes and kettles, between Gage Hill and Lake Luzerne. Kame terraces are in several locations, but are nowhere more dramatic than in the complex that formed along the northern and western edge of a large lobe of ice that extended down the Champlain Valley and across the lowlands, blocking the end of the Lake George. This large ice contact feature, in combination with an esker complex, consists of Hinckley soils that contain coarse sand, gravel, and boulders. These soils are visible in the Queensbury landfill and grade to well-sorted, sandy Plainfield soils west of Glens Falls. The terraces form the topographic high points along the base of the mountains traversed by U.S. Route 9 between Glens Falls and Lake George.

The floor of the valley, for the most part, is sandy Oakville soils and clayey Hudson, Rhinebeck, and Madalin soils that were deposited in large, proglacial Lake Albany, which extended southward to south of the Albany area. The low, swampy areas include organic Carlisle and Palms soils in the vicinity of the Warren County Airport. Kame terraces and delta areas, which consist of Hinckley and Plainfield soils, also formed in other valleys, such as the Schroon Valley, where stagnant ice lay for a considerable period.

The youngest deposits in the county are alluvial sediments deposited along the flood plains of the major streams. Well drained Tioga soils and moderately well drained and somewhat poorly drained Middlebury soils are examples of soils that have been forming in these recent sediments.

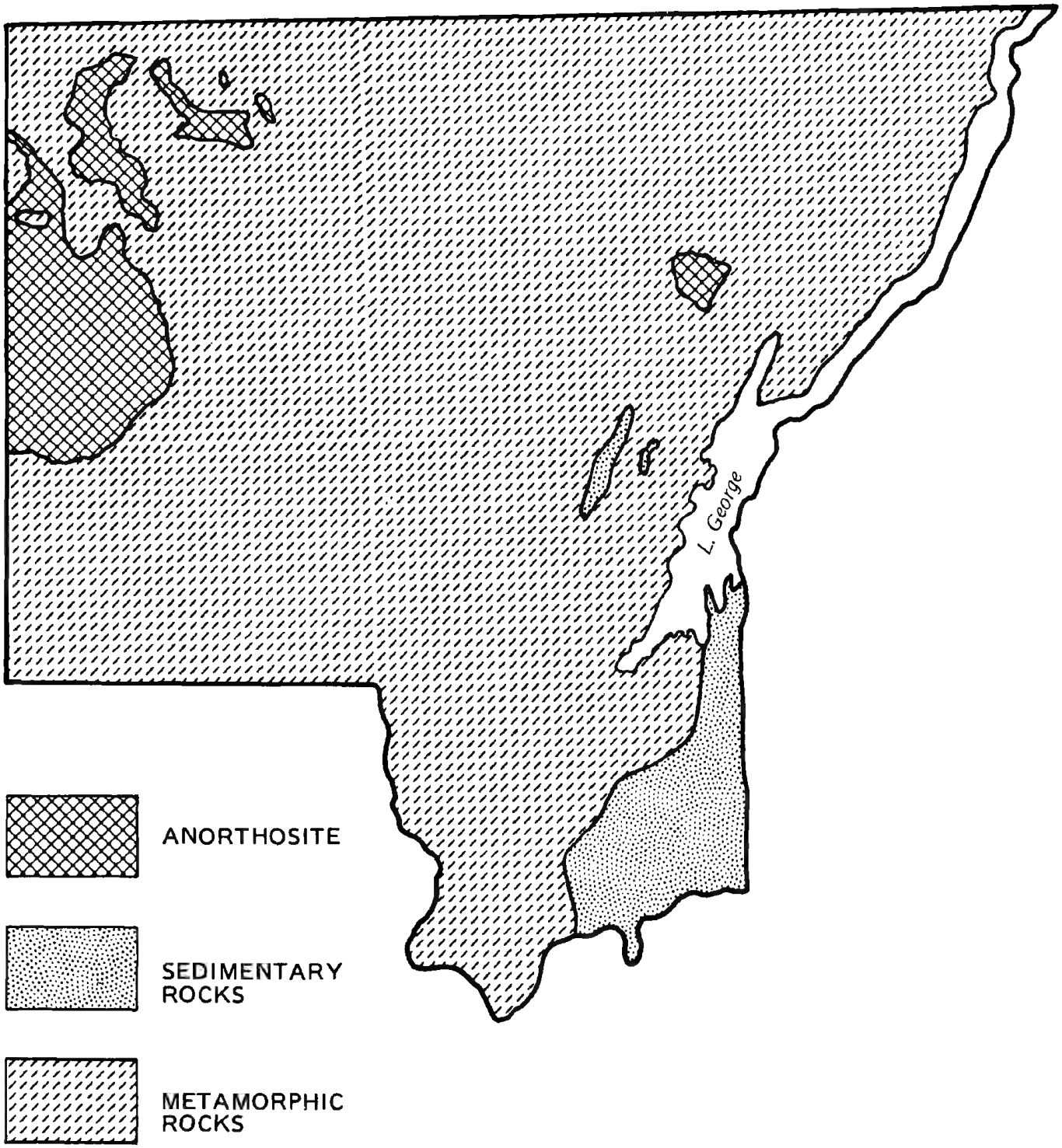


Figure 10.—Bedrock geology of Warren County (plan view).

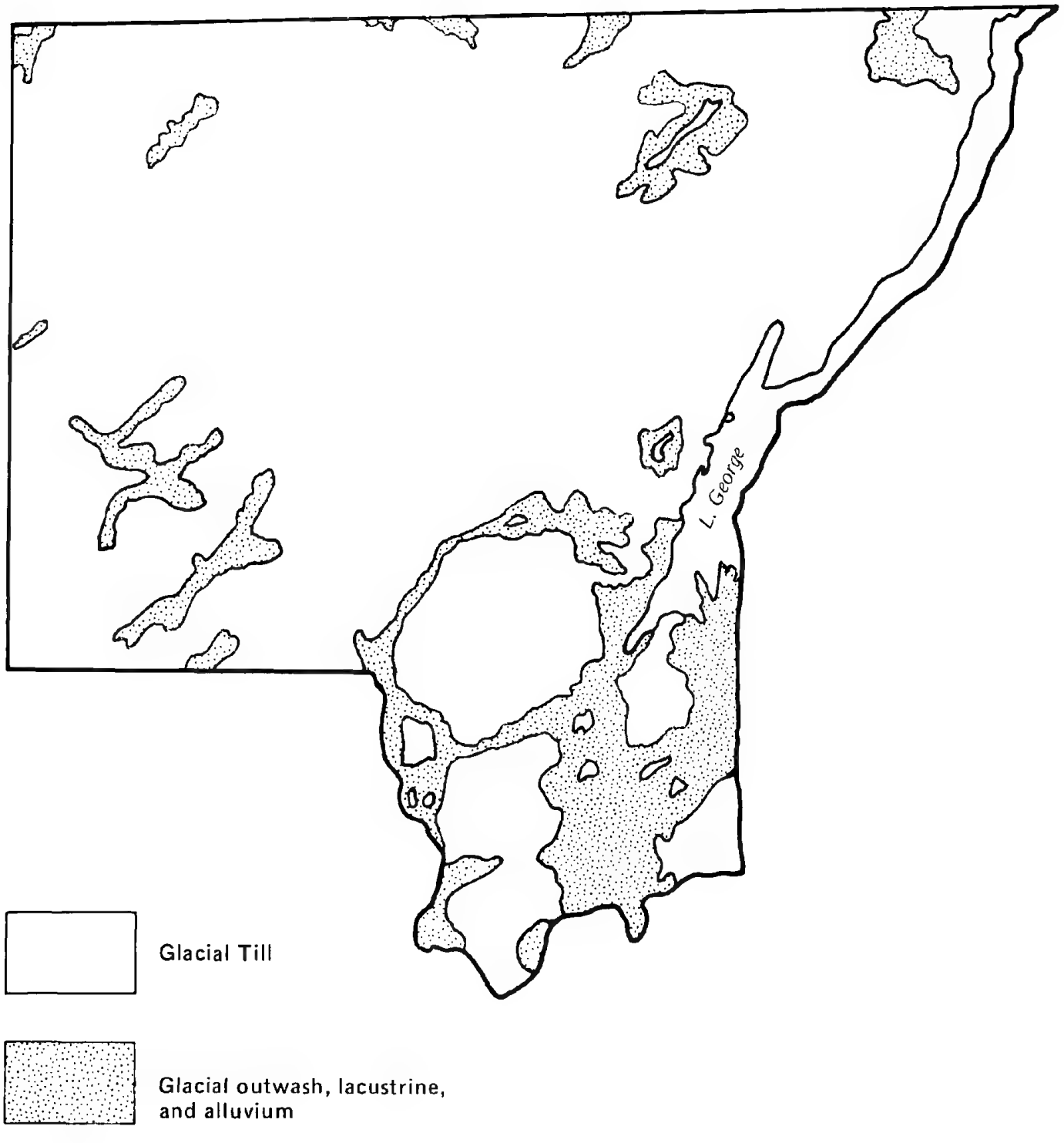


Figure 11.—Glacial deposits of Warren County (plan view).

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds just beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congeliturbate. Soil material disturbed by frost action.

Conservation tillage. A tillage and planting system in which crop residue covers at least 30 percent of the soil surface after planting. Where soil erosion by wind is the main concern, the system leaves the equivalent of at least 1,000 pounds per acre of flat small-grain residue on the surface during the critical erosion period.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and

resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion. *Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. (flaggy soils). A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial melt water. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as

protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

A2 horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or A2 horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore,

intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material).

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting ground ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables.) Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Much has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms,

and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multipled by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity are—

	SAR
Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period the the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon, generally an A2 horizon, below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifiying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by melt water streams, in glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-76 at Glens Falls, New York]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	28.3	8.1	18.2	51	-24	8	2.35	1.20	3.34	6	15.3
February---	31.4	11.3	21.4	52	-21	0	2.51	1.53	3.38	6	16.7
March------	40.2	22.6	31.4	67	-6	16	2.91	1.85	3.86	7	12.2
April------	55.7	34.2	45.0	82	17	180	3.10	2.21	3.91	7	1.3
May--------	67.1	43.9	55.5	89	27	488	3.12	1.79	4.30	7	.1
June-------	76.8	53.9	65.4	93	38	762	3.19	1.64	4.54	7	.0
July-------	81.2	58.1	69.7	95	44	921	3.04	1.79	4.14	6	.0
August-----	78.9	56.0	67.5	92	40	853	3.22	1.86	4.43	7	.0
September--	70.8	48.2	59.5	89	29	585	2.91	1.27	4.30	7	.0
October----	59.7	37.7	48.7	80	18	283	2.71	1.14	4.06	5	.1
November---	45.5	29.3	37.4	68	8	60	2.97	1.76	4.05	7	3.6
December---	32.8	16.0	24.4	60	-16	13	3.05	1.61	4.31	6	16.4
Yearly:											
Average--	55.7	34.9	45.3	---	---	---	---	---	---	---	---
Extreme--	---	---	---	96	-27	---	---	---	---	---	---
Total----	---	---	---	---	---	4,169	35.08	29.47	40.44	78	65.7

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-76 at Glens Falls, New York]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 2	May 17	June 16
2 years in 10 later than--	April 20	May 3	May 31
5 years in 10 later than--	March 27	April 7	April 29
First freezing temperature in fall:			
1 year in 10 earlier than--	October 8	September 27	September 19
2 years in 10 earlier than--	October 15	October 3	September 23
5 years in 10 earlier than--	October 27	October 13	September 29

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-76 at Glens Falls, New York]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	182	160	125
8 years in 10	190	167	132
5 years in 10	206	181	144
2 years in 10	222	195	156
1 year in 10	231	203	163

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AgA	Agawam fine sandy loam, 0 to 3 percent slopes	146	*
BaA	Belgrade silt loam, 0 to 3 percent slopes	135	*
BaB	Belgrade silt loam, 3 to 8 percent slopes	177	*
BcB	Bice fine sandy loam, 3 to 8 percent slopes	3,026	0.5
BcC	Bice fine sandy loam, 8 to 15 percent slopes	2,028	0.4
BcD	Bice fine sandy loam, 15 to 25 percent slopes	187	*
BdC	Bice very bouldery fine sandy loam, sloping	93,894	16.7
BdE	Bice very bouldery fine sandy loam, steep	32,393	5.7
BeC	Bice-Woodstock very bouldery fine sandy loams, sloping	20,978	3.7
BeE	Bice-Woodstock very bouldery fine sandy loams, steep	32,527	5.8
Ca	Carlisle muck	1,017	0.2
Ce	Castile gravelly fine sandy loam	738	0.1
Cg	Cathro and Greenwood mucks	6,683	1.2
ChB	Charlton fine sandy loam, 3 to 8 percent slopes	3,178	0.6
ChC	Charlton fine sandy loam, 8 to 15 percent slopes	1,500	0.3
ChD	Charlton fine sandy loam, 15 to 25 percent slopes	621	0.1
Du	Dumps, mine	76	*
ElB	Elmridge fine sandy loam, 3 to 8 percent slopes	263	*
En	Elnora loamy fine sand	1,111	0.2
FaB	Farmington loam, 0 to 8 percent slopes	570	0.1
FrC	Farmington loam, very rocky, 3 to 15 percent slopes	182	*
Fu	Fluvaquents-Udifluvents complex, frequently flooded	5,395	1.0
GaB	Galway loam, 3 to 8 percent slopes	411	0.1
HaB	Hartland very fine sandy loam, 3 to 8 percent slopes	532	0.1
HaC	Hartland very fine sandy loam, 8 to 15 percent slopes	146	*
HeC	Hermon very bouldery fine sandy loam, sloping	18,481	3.3
HeE	Hermon very bouldery fine sandy loam, steep	50,723	9.0
HmC	Hermon-Lyman-Rock outcrop complex, sloping	2,490	0.4
HmE	Hermon-Lyman-Rock outcrop complex, steep	36,765	6.5
HnA	Hinckley cobbly sandy loam, 0 to 3 percent slopes	887	0.2
HnB	Hinckley cobbly sandy loam, 3 to 8 percent slopes	11,273	2.0
HnC	Hinckley cobbly sandy loam, 8 to 15 percent slopes	6,856	1.2
HpA	Hinckley-Plainfield complex, level	647	0.1
HpC	Hinckley-Plainfield complex, sloping	13,156	2.3
HpE	Hinckley-Plainfield complex, steep	8,747	1.5
HuB	Hudson silt loam, 3 to 8 percent slopes	612	0.1
HuC	Hudson silt loam, 8 to 15 percent slopes	212	*
LmC	Lyman-Rock outcrop complex, sloping	1,115	0.2
LmE	Lyman-Rock outcrop complex, steep	15,794	2.8
LnA	Lyme fine sandy loam, 0 to 3 percent slopes	343	0.1
LyA	Lyme very stony fine sandy loam, nearly level	11,826	2.1
Ma	Madalin silt loam	914	0.2
MrC	Marlow very bouldery fine sandy loam, sloping	18,062	3.2
MrE	Marlow very bouldery fine sandy loam, steep	35,467	6.3
MsA	Massena fine sandy loam, 0 to 3 percent slopes	557	0.1
Mu	Middlebury fine sandy loam	1,032	0.2
OaA	Oakville loamy fine sand, 0 to 3 percent slopes	6,039	1.1
OaB	Oakville loamy fine sand, 3 to 8 percent slopes	7,495	1.3
OaC	Oakville loamy fine sand, 8 to 15 percent slopes	2,350	0.4
Pa	Palms muck	305	0.1
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	205	*
PbC	Paxton fine sandy loam, 8 to 15 percent slopes	112	*
PeB	Peru very bouldery loam, gently sloping	5,739	1.0
Pg	Pits, sand and gravel	340	0.1
Ph	Pits, quarry	80	*
PlA	Plainfield loamy sand, 0 to 3 percent slopes	1,052	0.2
PlB	Plainfield loamy sand, 3 to 8 percent slopes	4,930	0.9
PlC	Plainfield loamy sand, 8 to 15 percent slopes	2,224	0.4
PoE	Plainfield and Oakville soils, steep	1,555	0.3
Ra	Raynham silt loam	671	0.1
RhA	Rhinebeck silt loam, 0 to 3 percent slopes	411	0.1
RhB	Rhinebeck silt loam, 3 to 8 percent slopes	206	*
Ro	Rock outcrop	10,581	1.9

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
Sa	Saprists and Aquepts, inundated	2,458	0.4
ScA	Schroon gravelly fine sandy loam, 0 to 3 percent slopes	416	0.1
ScB	Schroon gravelly fine sandy loam, 3 to 8 percent slopes	892	0.2
SdB	Schroon very bouldery fine sandy loam, gently sloping	5,353	0.9
Sh	Shaker fine sandy loam	192	*
SoB	Stowe fine sandy loam, 3 to 8 percent slopes	504	0.1
SoC	Stowe fine sandy loam, 8 to 15 percent slopes	710	0.1
SoD	Stowe fine sandy loam, 15 to 25 percent slopes	242	*
StC	Stowe very bouldery fine sandy loam, sloping	7,699	1.4
StE	Stowe very bouldery fine sandy loam, steep	6,466	1.1
SuB	Sutton fine sandy loam, 3 to 8 percent slopes	582	0.1
To	Tioga fine sandy loam	512	0.1
Ud	Udorthents, smoothed	593	0.1
Wa	Wareham loamy sand	4,735	0.9
WgB	Woodbridge fine sandy loam, 3 to 8 percent slopes	263	*
WoC	Woodstock-Rock outcrop complex, sloping	7,144	1.3
WoE	Woodstock-Rock outcrop complex, steep	34,692	6.1
	Water	3,499	0.6
	Total	565,120	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name]

Map symbol	Soil name
AgA	Agawam fine sandy loam, 0 to 3 percent slopes
BaA	Belgrade silt loam, 0 to 3 percent slopes
BcB	Bice fine sandy loam, 3 to 8 percent slopes
Ce	Castile gravelly fine sandy loam
ChB	Charlton fine sandy loam, 3 to 8 percent slopes
ElB	Elmridge fine sandy loam, 3 to 8 percent slopes
En	Elnora loamy fine sand
GaB	Galway loam, 3 to 8 percent slopes
LnA	Lyme fine sandy loam, 0 to 3 percent slopes (where drained)
MsA	Massena fine sandy loam, 0 to 3 percent slopes (where drained)
Mu	Middlebury fine sandy loam
PbB	Paxton fine sandy loam, 3 to 8 percent slopes
Ra	Raynham silt loam (where drained)
RhA	Rhinebeck silt loam, 0 to 3 percent slopes (where drained)
ScA	Schroon fine sandy loam, 0 to 3 percent slopes
ScB	Schroon fine sandy loam, 3 to 8 percent slopes
Sh	Shaker fine sandy loam (where drained)
SoB	Stowe fine sandy loam, 3 to 8 percent slopes
SuB	Sutton fine sandy loam, 3 to 8 percent slopes
To	Tioga fine sandy loam
WgB	Woodbridge fine sandy loam, 3 to 8 percent slopes

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Land capability	Corn	Corn silage	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Oats	Pasture
		Bu	Tons	Tons	Tons	Tons	Bu	AUM*
AgA---------- Agawam	I	110	22	5.0	5.0	4.0	---	9.5
BaA---------- Belgrade	IIw	110	22	4.5	4.5	4.0	---	8.5
BaB---------- Belgrade	IIe	110	22	4.5	4.5	4.0	---	8.5
BcB---------- Bice	IIe	90	18	5.0	5.0	4.0	90	9.5
BcC---------- Bice	IIIe	90	18	5.0	5.0	4.0	85	9.5
BcD---------- Bice	IVe	80	16	4.5	4.5	4.0	70	8.5
BdC---------- Bice	VIs	---	---	---	---	---	---	4.0
BdE---------- Bice	VIIs	---	---	---	---	---	---	---
BeC---------- Bice-Woodstock	VIs	---	---	---	---	---	---	3.7
BeE---------- Bice-Woodstock	VIIs	---	---	---	---	---	---	---
Ca---------- Carlisle	Vw	---	---	---	---	---	---	---
Ce---------- Castile	IIw	90	18	4.5	4.5	4.0	90	8.5
Cg---------- Cathro and Greenwood	VIIw	---	---	---	---	---	---	---
ChB---------- Charlton	IIe	90	18	5.0	5.0	4.5	---	9.5
ChC---------- Charlton	IIIe	90	18	5.0	5.0	4.5	---	9.5
ChD---------- Charlton	IVe	80	16	4.5	4.5	4.0	---	8.5
Du**. Dumps								
ElB---------- Elmridge	IIw	90	18	5.0	5.0	4.0	---	9.5
En***---------- Elnora	IIIw	80	16	3.5	3.5	3.0	---	6.5

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Oats	Pasture
		Bu	Tons	Tons	Tons	Tons	Bu	AUM*
FaB---- Farmington	IIIs	60	12	3.5	3.5	3.0	70	6.5
FrC---- Farmington	VIs	---	---	---	---	---	---	5.5
Fu---- Fluvaquents-Udifluvents	Vw	---	---	---	---	---	---	4.0
GaB---- Galway	IIe	90	18	4.5	4.5	4.0	80	8.5
HaB---- Hartland	IIe	115	23	5.0	5.0	4.5	---	9.5
HaC---- Hartland	IIIe	110	22	4.5	4.5	4.0	---	8.5
HeC---- Hermon	VIs	---	---	---	---	---	---	4.0
HeE---- Hermon	VIIs	---	---	---	---	---	---	---
HmC**---- Hermon-Lyman-Rock outcrop	VIIs	---	---	---	---	---	---	---
HmE**---- Hermon-Lyman-Rock outcrop	VIIIs	---	---	---	---	---	---	---
HnA, HnB***---- Hinckley	IIIs	80	16	2.5	2.5	2.0	---	4.5
HnC***---- Hinckley	IVe	70	14	2.5	2.5	2.0	---	4.5
HpA***---- Hinckley-Plainfield	IIIs	60	12	2.5	2.5	2.0	---	4.5
HpC***---- Hinckley-Plainfield	IVe	55	11	2.5	2.5	2.0	---	4.5
HpE---- Hinckley-Plainfield	VIIe	---	---	---	---	---	---	---
HuB---- Hudson	IIe	90	18	4.0	4.0	4.0	70	7.5
HuC---- Hudson	IIIe	80	16	4.0	4.0	4.0	65	7.5
LmC**---- Lyman-Rock outcrop	VIs	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Oats	Pasture
		Bu	Tons	Tons	Tons	Tons	Bu	AUM*
LmE**---------- Lyman-Rock outcrop	VIIs	---	---	---	---	---	---	---
LnA---------- Lyme	IVw	---	15	---	3.5	---	---	6.5
LyA---------- Lyme	VIIs	---	---	---	---	---	---	---
Ma---------- Madalin	IVw	---	15	---	3.0	3.0	---	5.5
MrC---------- Marlow	VIs	---	---	---	---	---	---	4.0
MrE---------- Marlow	VIIs	---	---	---	---	---	---	---
MsA---------- Massena	IIIw	90	18	3.5	3.0	---	---	5.5
Mu---------- Middlebury	IIw	110	22	4.5	4.5	4.0	80	8.5
OaA, OaB***----- Oakville	IVs	70	14	4.0	4.0	3.0	48	7.5
OaC***---------- Oakville	VIe	60	12	3.5	3.5	3.0	35	6.5
Pa---------- Palms	Vw	---	---	---	---	---	---	---
PbB---------- Paxton	IIe	90	18	4.5	4.5	4.0	---	8.5
PbC---------- Paxton	IIIe	80	16	4.5	4.5	4.0	---	8.5
PeB---------- Peru	VIs	---	---	---	---	---	---	4.0
Pg**, Ph**. Pits								
PlA, PlB***----- Plainfield	IVs	70	14	4.0	4.0	3.5	45	7.5
PlC***---------- Plainfield	VIe	60	12	3.5	3.5	3.5	40	6.5
PoE---------- Plainfield and Oakville	VIIe	---	---	---	---	---	---	5.5
Ra---------- Raynham	IVw	90	18	---	3.5	3.5	---	6.5
RhA---------- Rhinebeck	IIIw	80	16	---	3.0	3.0	65	5.5

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Corn silage	Alfalfa hay	Grass-legume hay	Trefoil-grass hay	Oats	Pasture
		Bu	Tons	Tons	Tons	Tons	Bu	AUM*
RhB---------- Rhinebeck	IIIw	80	16	---	3.0	3.0	65	5.5
Ro**. Rock outcrop	VIIIs	---	---	---	---	---	---	---
Sa---------- Saprists and Aquepts	VIIIw	---	---	---	---	---	---	---
ScA, ScB-------- Schroon	IIw	90	18	4.5	4.5	4.0	---	8.5
SdB---------- Schroon	VIs	80	16	4.0	4.0	3.5	---	7.5
Sh---------- Shaker	IVw	90	18	---	3.5	3.5	---	6.5
SoB---------- Stowe	IIe	100	20	4.0	3.5	3.0	---	6.5
SoC---------- Stowe	IIIe	90	18	4.0	3.5	3.0	---	6.5
SoD---------- Stowe	IVe	---	---	3.5	3.5	3.0	---	6.5
StC---------- Stowe	VIs	---	---	---	---	---	---	5.0
StE---------- Stowe	VIIs	---	---	---	---	---	---	4.0
SuB---------- Sutton	IIw	110	22	4.0	4.0	3.5	---	7.5
To---------- Tioga	I	110	22	4.5	4.5	4.0	80	8.5
Ud---------- Udorthents	---	---	---	---	---	---	---	---
Wa---------- Wareham	IVw	70	14	---	3.0	3.0	---	5.5
WgB---------- Woodbridge	IIw	110	22	4.0	4.0	3.5	---	7.5
WoC**---------- Woodstock-Rock outcrop	VIs	---	---	---	---	---	---	---
WoE**---------- Woodstock-Rock outcrop	VIIs	---	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

***Moisture stress may be a limiting factor for obtaining these yields.

TABLE 7.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	658	---	---	---
II	12,966	8,645	4,321	---
III	20,370	4,708	2,285	13,377
IV	48,548	21,062	6,855	20,631
V	6,717	---	6,717	---
VI	182,106	---	4,574	177,532
VII	239,363	8,747	8,238	222,378
VIII	49,804	---	2,458	47,346

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
AgA---------- Agawam	3o	Slight	Slight	Slight	Slight	Eastern white pine--	66	Eastern white pine, red pine, white spruce, Norway spruce, Scotch pine.
						White ash----------	76	
						Northern red oak----	83	
						Sugar maple---------	65	
						Beech---------------	---	
						Yellow birch--------	---	
						Basswood------------	---	
						Hemlock-------------	---	
BaA, BaB-------- Belgrade	3o	Slight	Slight	Slight	Slight	Eastern white pine--	75	Eastern white pine, red pine, European larch, white spruce, Japanese larch, Scotch pine.
						Northern red oak----	62	
BcB, BcC-------- Bice	4o	Slight	Slight	Slight	Slight	Northern red oak----	66	Eastern white pine, red pine, white spruce, eastern hemlock, European larch, Japanese larch, Scotch pine.
						Eastern white pine--	---	
						Red spruce----------	---	
						Red maple-----------	---	
						Sugar maple---------	73	
						Beech---------------	---	
						Hemlock-------------	---	
						White birch---------	76	
BcD---------- Bice	4r	Slight	Moderate	Slight	Slight	Northern red oak----	66	Eastern white pine, red pine, white spruce, eastern hemlock, European larch, Japanese larch, Scotch pine.
						Eastern white pine--	---	
						Red spruce----------	---	
						Red maple-----------	---	
						Sugar maple---------	73	
						Beech---------------	---	
						Hemlock-------------	---	
						White birch---------	76	
BdC---------- Bice	4o	Slight	Slight	Slight	Slight	Northern red oak----	66	Eastern white pine, red pine, white spruce, eastern hemlock, European larch, Japanese larch, Scotch pine.
						Eastern white pine--	---	
						Red spruce----------	---	
						Red maple-----------	---	
						Sugar maple---------	73	
						Beech---------------	---	
						Hemlock-------------	---	
						White birch---------	76	
BdE---------- Bice	4r	Slight	Moderate	Slight	Slight	Northern red oak----	66	Eastern white pine, red pine, white spruce, eastern hemlock, European larch, Japanese larch, Scotch pine.
						Eastern white pine--	---	
						Red spruce----------	---	
						Red maple-----------	---	
						Sugar maple---------	73	
						Beech---------------	---	
						Hemlock-------------	---	
						White birch---------	76	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
BeC---------- Bice	4o	Slight	Slight	Slight	Slight	Northern red oak----	66	Eastern white pine, red pine, white spruce, eastern hemlock, European larch, Japanese larch, Scotch pine.
						Eastern white pine--	---	
						Red spruce----------	---	
						Red maple----------	---	
						Sugar maple---------	73	
						Beech---------------	---	
						Hemlock-------------	---	
						White birch---------	76	
Woodstock------	4d	Slight	Slight	Slight	Moderate	Northern red oak----	47	Eastern white pine, white spruce, Scotch pine, balsam fir.
						Eastern white pine--	60	
						Red spruce----------	41	
						Sugar maple---------	53	
						Yellow birch--------	53	
						Paper birch---------	58	
						White spruce--------	64	
						Balsam fir----------	58	
						Hemlock-------------	---	
						Red pine------------	60	
						Red maple----------	60	
BeE*---------- Bice	4r	Slight	Moderate	Slight	Slight	Northern red oak----	66	Eastern white pine, white spruce, Scotch pine, balsam fir.
						Eastern white pine--	---	
						Red spruce----------	---	
						Red maple----------	---	
						Sugar maple---------	73	
						Beech---------------	---	
						Hemlock-------------	---	
						White birch---------	76	
Woodstock------	4d	Slight	Slight	Slight	Moderate	Northern red oak----	47	Eastern white pine, white spruce, Scotch pine, balsam fir. pine, balsam fir, tamarack.
						Eastern white pine--	60	
						Red spruce----------	41	
						Sugar maple---------	53	
						Yellow birch--------	53	
						Paper birch---------	58	
						White spruce--------	64	
						Balsam fir----------	58	
						Hemlock-------------	---	
						Red pine------------	60	
						Red maple----------	60	
Ca---------- Carlisle	4w	Slight	Severe	Severe	Severe	Red maple----------	74	Eastern cottonwood, green ash, black willow.
						White ash-----------	---	
						White cedar---------	---	
						Quaking aspen-------	---	
						Swamp white oak-----	---	
						Red spruce----------	---	
						White spruce--------	---	
Ce---------- Castile	3o	Slight	Slight	Slight	Slight	Sugar maple---------	---	Eastern white pine, Norway spruce, white spruce, Scotch pine.
						Northern red oak----	---	
						Beech---------------	---	
						White birch---------	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
Cg*:								
Cathro	5w	Slight	Severe	Severe	Severe	Balsam fir	---	
						Northern white-cedar	---	
						Tamarack	---	
						Red maple	---	
						Red spruce	---	
Greenwood	5w	Slight	Severe	Severe	Severe	Balsam fir	---	
						Red spruce	---	
						Tamarack	---	
						Red maple	---	
						White cedar	---	
ChB, ChC Charlton	4o	Slight	Slight	Slight	Slight	Northern red oak	87	Eastern white pine, red pine, white spruce, eastern hemlock, European larch, Japanese larch, Scotch pine.
						Eastern white pine	67	
						Red spruce	---	
						Red maple	---	
						White oak	51	
						Sugar maple	---	
						Hemlock	---	
						Beech	---	
						White ash	---	
ChD Charlton	4o	Slight	Moderate	Slight	Slight	Northern red oak	87	Eastern white pine, red pine, white spruce, eastern hemlock, European larch, Japanese larch, Scotch pine.
						Eastern white pine	67	
						Red spruce	---	
						Red maple	---	
						White oak	51	
						Sugar maple	---	
						Hemlock	---	
						Beech	---	
						White ash	---	
ElB Elmridge	3o	Slight	Slight	Slight	Slight	Eastern white pine	---	Eastern white pine, European larch, white spruce, Japanese larch, Scotch pine.
						Northern red oak	---	
						Yellow birch	---	
						Red maple	---	
En Elnora	4s	Slight	Slight	Severe	Slight	Northern red oak	---	Eastern white pine, Norway spruce, Scotch pine.
						Eastern white pine	---	
						Sugar maple	---	
						Yellow birch	---	
						Red maple	---	
FaB Farmington	5d	Slight	Slight	Severe	Moderate	Sugar maple	50	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine, white spruce.
						Northern red oak	---	
						Eastern white pine	33	
						American basswood	50	
						White ash	43	
						Eastern hemlock	---	
						White oak	---	
FrC Farmington	5d	Slight	Moderate	Severe	Moderate	Sugar maple	50	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine, white spruce.
						Northern red oak	---	
						Eastern white pine	33	
						American basswood	50	
						White ash	43	
						Eastern hemlock	---	
						White oak	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
GaB---------- Galway	3o	Slight	Slight	Slight	Slight	Sugar maple--------- Northern red oak---- White ash---------- Eastern white pine-- Eastern hemlock----- White oak----------	--- --- --- --- --- ---	Eastern white pine, European larch, Norway spruce, red pine, Japanese larch, white spruce, Scotch pine.
HaB---------- Hartland	3o	Slight	Slight	Slight	Slight	Sugar maple--------- Eastern white pine-- Hemlock---------- Beech---------- White birch--------- Northern red oak----	--- 68 --- --- --- ---	Eastern white pine, red pine, white spruce, Norway spruce, European larch, Japanese larch.
HaC---------- Hartland	3r	Moderate	Slight	Slight	Slight	Sugar maple--------- Eastern white pine-- Hemlock---------- Beech---------- White birch--------- Northern red oak----	--- 68 --- --- --- ---	Eastern white pine, red pine, white spruce, Norway spruce, European larch, Japanese larch.
HeC---------- Hermon	4s	Slight	Moderate	Moderate	Slight	Eastern white pine-- White spruce-------- Red spruce---------- Sugar maple--------- Beech---------- Hemlock---------- White ash---------- Yellow birch--------	63 --- 45 --- --- --- --- ---	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine.
HeE---------- Hermon	4s	Slight	Moderate	Moderate	Slight	Eastern white pine-- White spruce-------- Red spruce---------- Sugar mapple-------- Beech---------- Hemlock---------- White ash---------- Yellow birch--------	63 --- 45 --- --- --- --- ---	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine.
HmC*---------- Hermon	4s	Slight	Slight	Moderate	Slight	Eastern white pine-- White spruce-------- Red spruce---------- Sugar maple--------- Beech---------- Hemlock---------- White ash---------- Yellow birch--------	63 --- 45 --- --- --- --- ---	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine.
Lyman----------	4d	Slight	Slight	Severe	Moderate	Sugar maple--------- White spruce-------- Balsam fir---------- Red spruce---------- Hemlock---------- Paper birch---------	--- 57 48 49 --- 65	Eastern white pine, red pine, white spruce, balsam fir, Scotch pine.
Rock outcrop.								

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
HmE*:								
Hermon	4s	Slight	Moderate	Moderate	Slight	Eastern white pine	63	Eastern white pine, red pine, European larch, Scotch pine, Japanese larch.
						White spruce	---	
						Red spruce	45	
						Beech	---	
						Sugar maple	---	
						Hemlock	---	
						White ash	---	
						Yellow birch	---	
Lyman	4d	Slight	Moderate	Severe	Moderate	Sugar maple	---	Eastern white pine, red pine, Scotch pine, white spruce, balsam fir.
						White spruce	57	
						Balsam fir	48	
						Red spruce	49	
						Hemlock	---	
						Paper birch	65	
Rock outcrop.								
HnA, HnB, HnC---Hinckley	5s	Slight	Slight	Severe	Slight	Northern red oak	52	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine.
						Eastern white pine	60	
						Red pine	59	
						Sugar maple	66	
						Hemlock	---	
						Paper birch	---	
HpA**: Hinckley	5s	Slight	Slight	Severe	Slight	Northern red oak	52	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine.
						Eastern white pine	60	
						Red pine	59	
						Sugar maple	66	
						Hemlock	---	
						Paper birch	---	
Plainfield	3s	Slight	Slight	Moderate	Slight	Red pine	---	Eastern white pine, red pine, Scotch pine, jack pine.
						Eastern white pine	66	
						Jack pine	---	
						Northern pin oak	---	
						Black oak	---	
						White oak	---	
						Northern red oak	62	
						Yellow birch	---	
						Paper birch	72	
						Scarlet oak		
HpC*: Hinckley	5s	Slight	Slight	Severe	Slight	Northern red oak	52	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine.
						Eastern white pine	60	
						Red pine	59	
						Sugar maple	66	
						Hemlock	---	
						Paper birch	---	
Plainfield	3s	Slight	Slight	Moderate	Slight	Red pine	---	Eastern white pine, red pine, Scotch pine, jack pine.
						Eastern white pine	66	
						Jack pine	---	
						Northern pin oak	---	
						Black oak	---	
						White oak	---	
						Northern red oak	---	
						Yellow birch	---	
						Paper birch	72	
						Scarlet pine	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
HpE*:								
Hinckley-------	5S	Slight	Moderate	Severe	Slight	Northern red oak----	52	Eastern white pine, red pine, European larch, Japanese larch, Scotch pine.
						Eastern white pine--	60	
						Red pine----------	59	
						Sugar maple-------	66	
						Hemlock-----------		
						Paper birch-------		
Plainfield-----	3r	Moderate	Severe	Moderate	Slight	Red pine----------	---	Red pine, eastern white pine, jack pine, Scotch pine.
						Eastern white pine--	66	
						Jack pine---------	---	
						Northern pin oak----	---	
						Black oak---------	---	
						White oak---------	---	
						Northern red oak----	62	
						Scarlet oak-------	---	
						Yellow birch------	---	
						Paper birch-------	72	
HuB---------- Hudson	2o	Slight	Slight	Slight	Slight	Northern red oak----	---	Eastern white pine, yellow-poplar, black walnut, Scotch pine, white spruce, European larch, Japanese larch.
						Sugar maple-------	---	
						Eastern white pine--	---	
						White ash---------	---	
						Red maple---------	---	
						Yellow birch------	---	
						White spruce------	---	
HuC---------- Hudson	2r	Moderate	Slight	Slight	Slight	Northern red oak----	---	Eastern white pine, yellow-poplar, black walnut, Scotch pine, white spruce, European larch, Japanese larch.
						Sugar maple-------	---	
						Eastern white pine--	---	
						White ash---------	---	
						Red maple---------	---	
						Yellow birch------	---	
						White spruce------	---	
LmC*:								
Lyman----------	4d	Slight	Moderate	Severe	Moderate	Sugar maple-------	---	Eastern white pine, red pine, white spruce, balsam fir.
						White spruce------	57	
						Balsam fir--------	48	
						Red spruce--------	49	
Rock outcrop.								
LmE*:								
Lyman----------	4d	Slight	Moderate	Severe	Moderate	Sugar maple-------	---	Eastern white pine, red pine, white spruce, balsam fir.
						White spruce------	57	
						Balsam fir--------	48	
						Red spruce--------	49	
Rock outcrop.								
LnA---------- Lyme	4w	Slight	Severe	Severe	Severe	Northern red oak----	---	Eastern white pine, white spruce, eastern hemlock, European larch, Japanese larch.
						Eastern white pine--	---	
						Balsam fir--------	50	
						Red maple---------	---	
						Red spruce--------	---	
						Yellow birch------	---	
						White spruce------	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
LyA---------- Lyme	4w	Slight	Severe	Severe	Severe	Northern red oak----	---	Eastern white pine, white spruce, eastern hemlock, European larch, Japanese larch.
						Red spruce----------	---	
						Red maple----------	---	
						Eastern white pine--	---	
						Yellow birch--------	---	
						White spruce--------	---	
						Balsam fir----------	50	
Ma---------- Madalin	5w	Slight	Severe	Severe	Severe	Red maple----------	---	Eastern white pine, northern white-cedar, white spruce.
						White ash----------	---	
						White cedar---------	---	
						Hemlock-------------	---	
						Yellow birch--------	---	
MrC---------- Marlow	3o	Slight	Slight	Slight	Slight	Eastern white pine--	68	Eastern white pine, white spruce, balsam fir, European larch, Japanese larch, Scotch pine, Norway spruce.
						Balsam fir----------	58	
						Red spruce----------	48	
						Sugar maple---------	60	
						Red pine------------	65	
						Yellow birch--------	62	
						Paper birch---------	60	
						White spruce--------	62	
						White ash----------	67	
MrE---------- Marlow	3x	Moderate	Moderate	Slight	Slight	Eastern white pine--	68	Eastern white pine, white spruce, balsam fir, European larch, Japanese larch, Scotch pine, Norway spruce.
						Balsam fir----------	58	
						Red spruce----------	48	
						Sugar maple---------	60	
						Red pine------------	65	
						Yellow birch--------	62	
						Paper birch---------	60	
						White spruce--------	62	
						White ash----------	67	
MsA---------- Massena	3w	Slight	Moderate	Moderate	Moderate	Eastern white pine--	---	Eastern white pine, white spruce, northern white-cedar.
						Northern red oak----	---	
						Red maple----------	---	
						White spruce--------	---	
						White cedar---------	---	
Mu---------- Middlebury	2o	Slight	Slight	Slight	Slight	Northern red oak----	---	Eastern white pine, yellow-poplar, Norway spruce, European larch, black walnut, Japanese larch, Scotch pine.
						Sugar maple---------	---	
						Yellow-poplar-------	---	
						Yellow birch--------	---	
						Red maple----------	---	
						Eastern white pine--	---	
OaA, OaB, OaC--- Oakville	3s	Slight	Slight	Severe	Slight	Red pine------------	---	Red pine, eastern white pine, Norway spruce, white spruce, European larch, Japanese larch, Scotch pine.
						Northern red oak----	---	
						White oak----------	---	
						Quaking aspen-------	---	
						Black oak----------	---	
						Eastern white pine--	---	
						Yellow birch--------	---	
						Red maple----------	---	
						Balsam fir----------	---	
						Red spruce----------	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
Pa---------- Palms	4W	Slight	Severe	Severe	Severe	Red maple----------	---	
						Silver maple--------	---	
						White ash----------	---	
						Quaking aspen-------	---	
						Northern white-cedar	---	
						Tamarack----------	---	
						Black ash----------	---	
						Eastern white pine--	---	
PbB, PbC-------- Paxton	3o	Slight	Slight	Moderate	Slight	Northern red oak----	67	Red pine, eastern white pine, Norway spruce, European larch, Japanese larch, Douglas fir, Balsam fir, Scotch pine.
						Red pine----------	69	
						Eastern white pine--	61	
						Sugar maple---------	---	
						Hemlock------------	---	
						White spruce--------	---	
						White ash----------	89	
						Beech---------------	---	
						White birch---------	---	
PeB---------- Peru	3o	Slight	Slight	Slight	Slight	Sugar maple---------	56	Eastern white pine, red pine, white white spruce, European larch, Japanese larch, Scotch pine.
						Beech---------------	---	
						Northern red oak----	---	
						Red spruce----------	40	
						Balsam fir----------	63	
						White spruce--------	---	
						White birch---------	---	
						Hemlock------------	---	
PlA, PlB, PlC--- Plainfield	3s	Slight	Slight	Severe	Slight	Red pine----------	---	Red pine, eastern white pine, jack pine, Scotch pine.
						Eastern white pine--	66	
						Jack pine----------	---	
						Northern pin oak----	---	
						Black oak----------	---	
						White oak----------	---	
						Scarlet oak---------	---	
						Northern red oak----	62	
						Yellow birch--------	---	
PoE*: Plainfield	3r	Moderate	Severe	Severe	Slight	Red pine----------	---	Red pine, eastern white pine, jack pine, Scotch pine.
						Eastern white pine--	66	
						Jack pine----------	---	
						Northern pin oak----	---	
						Black oak----------	---	
						White oak----------	---	
						Scarlet oak---------	---	
						Northern red oak----	62	
						Yellow birch--------	---	
Oakville-------	3r	Moderate	Severe	Severe	Slight	Red pine----------	---	Red pine, eastern white pine, Norway spruce, white spruce, European larch, Japanese larch, Scotch pine.
						Northern red oak----	---	
						White oak----------	---	
						Quaking aspen-------	---	
						Black oak----------	---	
						Eastern white pine--	---	
						Yellow birch--------	---	
						Balsam fir----------	---	
						Red maple----------	---	
						Red spruce----------	---	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
Ra---------- Raynham	4w	Slight	Severe	Severe	Severe	Eastern white pine--	71	Eastern white pine, white spruce, northern white-cedar.
						White spruce--------	60	
						Red spruce----------	39	
						Red maple-----------	58	
						Yellow birch--------	---	
						White ash-----------	---	
RhA, RhB-------- Rhinebeck	3w	Slight	Moderate	Slight	Slight	Sugar maple---------	---	Eastern white pine, Norway spruce, European larch, white spruce, Japanese larch.
						Northern red oak----	---	
						Eastern white pine--	---	
						Red maple-----------	---	
						White spruce--------	---	
						Hemlock-------------	---	
ScA, ScB, SdB--- Schroon	4o	Slight	Slight	Slight	Slight	Sugar maple---------	---	Eastern white pine, white spruce, European larch, red pine, Japanese larch.
						Northern red oak----	---	
						Eastern white pine--	---	
						Red spruce----------	---	
						White spruce--------	---	
						Black cherry--------	---	
Sh---------- Shaker	5w	Slight	Severe	Severe	Severe	Eastern white pine--	55	Eastern white pine, white spruce.
						Red maple-----------	---	
						Sugar maple---------	---	
						White spruce--------	---	
						Yellow birch--------	---	
SoB, SoC-------- Stowe	3o	Slight	Slight	Slight	Slight	Eastern white pine--	---	Eastern white pine, Norway spruce, European larch, Japanese larch, Scotch pine, white spruce.
						Sugar maple---------	63	
						American beech------	---	
						Yellow birch--------	---	
						Paper birch---------	---	
						Red spruce----------	51	
						Eastern hemlock-----	---	
						Balsam fir----------	51	
						Red pine------------	---	
						Red maple-----------	71	
						White spruce--------	52	
SoD---------- Stowe	3r	Slight	Moderate	Slight	Slight	Eastern white pine--	---	Eastern white pine, Norway spruce, European larch, Japanese larch, Scotch pine, white spruce.
						Sugar maple---------	63	
						American beech------	---	
						Yellow birch--------	---	
						Paper birch---------	---	
						Red spruce----------	51	
						Eastern hemlock-----	---	
						Balsam fir----------	51	
						Red pine------------	---	
						Red maple-----------	71	
						White spruce--------	52	
StC---------- Stowe	3o	Slight	Slight	Slight	Slight	Eastern white pine--	---	Eastern white pine, Norway spruce, European larch, Japanese larch, Scotch pine, white spruce.
						Sugar maple---------	63	
						American beech------	---	
						Yellow birch--------	---	
						Paper birch---------	---	
						Red spruce----------	51	
						Eastern hemlock-----	---	
						Balsam fir----------	51	
						Red pine------------	---	
						Red maple-----------	71	
						White spruce--------	52	

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
StE---------- Stowe	3r	Slight	Moderate	Slight	Slight	Eastern white pine-- Sugar maple--------- American beech------ Yellow birch--------- Paper birch--------- Red spruce---------- Eastern hemlock----- Balsam fir---------- Red pine---------- Red maple---------- White spruce---------	--- 63 --- --- --- 51 --- 51 --- 71 52	Eastern white pine, Norway spruce, European larch, Japanese larch, Scotch pine, white spruce.
SuB---------- Sutton	4o	Slight	Slight	Slight	Slight	Red spruce---------- Sugar maple--------- Northern red oak---- Eastern white pine-- Black cherry--------- American beech------ Yellow birch--------- Hemlock----------	--- --- 72 65 --- --- --- ---	Eastern white pine, white spruce, European larch, Norway spruce, Japanese larch, Scotch pine.
To---------- Tioga	2o	Slight	Slight	Slight	Slight	Northern red oak---- Yellow-poplar------- Sugar maple--------- White pine---------- Hemlock----------	--- --- 86 --- ---	Eastern white pine, yellow-poplar, Norway spruce, black walnut, European larch Japanese larch.
Wa---------- Wareham	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple---------- Red spruce---------- Balsam fir---------- White spruce--------- Hemlock---------- White ash----------	62 --- --- --- --- --- ---	Eastern white pine, Norway spruce, White spruce.
WgB---------- Woodbridge	3o	Slight	Slight	Slight	Moderate	Eastern white pine-- Northern red oak---- Red pine---------- Red spruce---------- Sugar maple--------- White spruce--------- Hemlock---------- White oak---------- Yellow birch--------- Beech----------	67 72 65 50 65 --- --- --- --- ---	Eastern white pine, European larch, Japanese larch, Scotch pine, white spruce.
WoC*: Woodstock------	4d	Slight	Slight	Slight	Moderate	Eastern white pine-- Red pine---------- Red spruce---------- Sugar maple--------- Yellow birch--------- Paper birch--------- Hemlock---------- Balsam fir---------- Red maple----------	60 60 --- --- --- --- --- --- ---	Eastern white pine, white spruce, balsam fir, Scotch pine.
Rock outcrop.								

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant*
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
WoE*:								
Woodstock------	4d	Slight	Moderate	Severe	Moderate	Eastern white pine--	60	Eastern white pine, white spruce, balsam fir, Scotch pine.
						Red pine----------	60	
						Red spruce----------	---	
						Sugar maple---------	---	
						Yellow birch--------	---	
						Paper birch---------	---	
						Hemlock-------------	---	
						Balsam fir----------	---	
Rock outcrop.								

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AgA---- Agawam	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
BaA---- Belgrade	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: erodes easily.	Moderate: wetness.
BaB---- Belgrade	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
BcB---- Bice	Slight----	Slight----	Moderate: slope, small stones.	Slight----	Moderate: large stones.
BcC---- Bice	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----	Moderate: large stones, slope.
BcD---- Bice	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
BdC---- Bice	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones, small stones.	Slight----	Moderate: slope, large stones, small stones.
BdE---- Bice	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
BeC*: Bice----	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones, small stones.	Slight----	Moderate: slope, large stones, small stones.
Woodstock----	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: large stones, slope, small stones.	Slight----	Moderate: small stones, large stones, droughty.
BeE*: Bice----	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Severe: slope.
Woodstock----	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Moderate: small stones, large stones, droughty.
Ca---- Carlisle	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ce---------- Castile	Moderate: small stones, wetness.	Moderate: small stones, wetness.	Severe: small stones.	Moderate: wetness.	Moderate: small stones, wetness.
Cg*: Cathro----------	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Greenwood----------	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
ChB---------- Charlton	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
ChC---------- Charlton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
ChD---------- Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Du*. Dumps					
ElB---------- Elmridge	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
En---------- Elnora	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
FaB---------- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight----------	Severe: thin layer.
FrC---------- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight----------	Severe: thin layer.
Fu*: Fluvaquents. Udifluvents.					
GaB---------- Galway	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
HaB---------- Hartland	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
HaC---------- Hartland	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HeC---------- Hermon	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones, small stones.	Moderate: large stones.	Moderate: small stones, large stones, droughty.
HeE---------- Hermon	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Moderate: small stones, large stones, droughty.
HmC*: Hermon----------	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones, small stones.	Moderate: large stones.	Moderate: small stones, large stones, droughty.
Lyman----------	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, large stones, depth to rock.	Slight----------	Severe: thin layer, droughty.
Rock outcrop.					
HmE*: Hermon----------	Severe: slope.	Severe: slope.	Severe: slope, large stones, small stones.	Severe: slope.	Moderate: small stones, large stones, droughty.
Lyman----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: slope.	Severe: slope, thin layer, droughty.
Rock outcrop.					
HnA, HnB---------- Hinckley	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight----------	Severe: small stones, droughty.
HnC---------- Hinckley	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight----------	Severe: small stones, droughty.
HpA*: Hinckley----------	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight----------	Severe: small stones, droughty.
Plainfield----------	Slight----------	Slight----------	Slight----------	Slight----------	Moderate: droughty.
HpC*: Hinckley----------	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight----------	Severe: small stones, droughty.
Plainfield----------	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, droughty.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HpE*:					
Hinckley	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, droughty, slope.
Plainfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HuB Hudson	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
HuC Hudson	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
LmC*:					
Lyman	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, large stones, depth to rock.	Slight	Severe: thin layer, droughty.
Rock outcrop.					
LmE*:					
Lyman	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: slope.	Severe: slope, thin layer, droughty.
Rock outcrop.					
LnA Lyme	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
LyA Lyme	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
Ma Madalin	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
MrC Marlow	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: large stones, slope.
MrE Marlow	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MsA Massena	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Mu Middlebury	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
OaA Oakville	Slight	Slight	Slight	Slight	Moderate: droughty.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
OaB---------- Oakville	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
OaC---------- Oakville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, droughty.
Pa---------- Palms	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
PbB---------- Paxton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight----------	Slight.
PbC---------- Paxton	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
PeB---------- Peru	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: large stones, slope, wetness.	Moderate: wetness.	Moderate: large stones, wetness.
Pg*, Ph*. Pits					
PlA---------- Plainfield	Slight----------	Slight----------	Slight----------	Slight----------	Moderate: droughty.
PlB---------- Plainfield	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
PlC---------- Plainfield	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope, droughty.
PoE*: Plainfield----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Oakville----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ra---------- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
RhA, RhB---------- Rhinebeck	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Ro*. Rock outcrop					
Sa*: Saprists.					
Aquepts.					

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ScA---------- Schroon	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, wetness.	Moderate: wetness.	Moderate: wetness.
ScB---------- Schroon	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Moderate: wetness.	Moderate: wetness.
SdB---------- Schroon	Moderate: slope, large stones, wetness.	Moderate: slope, large stones, wetness.	Severe: large stones, slope.	Moderate: wetness.	Severe: droughty.
Sh---------- Shaker	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
SoB---------- Stowe	Moderate: small stones, wetness.	Moderate: wetness, small stones.	Moderate: small stones, slope.	Moderate: wetness.	Moderate: small stones, large stones.
SoC---------- Stowe	Moderate: slope, small stones, wetness.	Moderate: slope, wetness, small stones.	Severe: slope, small stones.	Moderate: wetness.	Moderate: small stones, large stones, slope.
SoD---------- Stowe	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: wetness, slope.	Severe: slope.
StC---------- Stowe	Moderate: slope, large stones, wetness.	Moderate: slope, large stones, wetness.	Severe: large stones, slope, small stones.	Moderate: large stones, wetness.	Moderate: small stones, large stones, slope.
StE---------- Stowe	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
SuB---------- Sutton	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones.	Moderate: wetness.	Moderate: wetness.
To---------- Tioga	Severe: flooding.	Slight----------	Moderate: flooding.	Severe: erodes easily.	Moderate: flooding.
Ud*. Udorthents					
Wa---------- Wareham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WgB---------- Woodbridge	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
WoC*: Woodstock----------	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: large stones, slope, small stones.	Slight----------	Moderate: small stones, large stones, droughty.
Rock outcrop.					
WoE*: Woodstock----------	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Moderate: small stones, large stones, droughty.
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AgA---- Agawam	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BaA---- Belgrade	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
BaB---- Belgrade	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BcB---- Bice	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BcC---- Bice	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BcD---- Bice	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BdC---- Bice	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BdE---- Bice	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BeC*:										
Bice----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Woodstock----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BeE*:										
Bice----	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Woodstock----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Ca---- Carlisle	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ce---- Castile	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Cg*:										
Cathro----	Poor	Fair	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
Greenwood----	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
ChB---- Charlton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ChC---- Charlton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ChD---------- Charlton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Du*. Dumps										
ElB---------- Elmridge	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
En---------- Elnora	Good	Good	Good	Fair	Fair	Poor	Poor	Good	Fair	Poor.
FaB, FrC---------- Farmington	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Fu*: Fluvaquents.										
Udifluvents.										
GaB---------- Galway	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HaB---------- Hartland	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HaC---------- Hartland	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HeC, HeE---------- Hermon	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
HmC*, HmE*: Hermon----------	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Lyman----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
HnA, HnB, HnC------ Hinckley	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
HpA*: Hinckley----------	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Plainfield--------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
HpC*: Hinckley----------	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Plainfield--------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
HpE*:										
Hinckley	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Plainfield	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
HuB---- Hudson	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HuC---- Hudson	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LmC*, LmE*:										
Lyman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
LnA---- Lyme	Good	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
LyA---- Lyme	Very poor.	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
Ma---- Madalin	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MrC---- Marlow	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MrE---- Marlow	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MsA---- Massena	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Mu---- Middlebury	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
OaA, OaB---- Oakville	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
OaC---- Oakville	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Pa---- Palms	Good	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good.
PbB---- Paxton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PbC---- Paxton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PeB---- Peru	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Pg*, Ph*. Pits										

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
PlA, PlB---------- Plainfield	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
PlC---------- Plainfield	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
PoE*: Plainfield--------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Oakville----------	Very poor.	Poor	Fair	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Ra---------- Raynham	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
RhA---------- Rhinebeck	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
RhB---------- Rhinebeck	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ro*. Rock outcrop										
Sa*: Saprists.										
Aquepts.										
ScA---------- Schroon	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
ScB---------- Schroon	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SdB---------- Schroon	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Sh---------- Shaker	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
SoB---------- Stowe	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SoC---------- Stowe	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SoD---------- Stowe	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
StC, StE---------- Stowe	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
SuB---------- Sutton	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
To---------- Tioga	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ud*. Udorthents										
Wa---------- Wareham	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
WgB---------- Woodbridge	Good	Good	Good	Good	Fair	Poor	Very poor.	Good	Good	Very poor.
WoC*, WoE*: Woodstock--------- Rock outcrop.	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AgA---------- Agawam	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
BaA---------- Belgrade	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
BaB---------- Belgrade	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: frost action.	Moderate: wetness.
BcB---------- Bice	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: large stones.
BcC---------- Bice	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
BcD---------- Bice	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BdC---------- Bice	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, small stones, large stones.	Moderate: slope, large stones, small stones.
BdE---------- Bice	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BeC*:						
Bice----------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, small stones, large stones.	Moderate: slope, large stones, small stones.
Woodstock--------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: small stones, large stones, droughty.
BeE*:						
Bice----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Woodstock--------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Moderate: small stones, large stones, droughty.
Ca---------- Carlisle	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action, subsides.	Severe: ponding, excess humus.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ce---- Castile	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: small stones, wetness.
Cg*: Cathro----	Severe: excess humus, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action, subsides.	Severe: ponding, excess humus.
Greenwood----	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action, subsides.	Severe: ponding, excess humus.
ChB---- Charlton	Slight----	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
ChC---- Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
ChD---- Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Du*. Dumps						
ElB---- Elmridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness.
En---- Elnora	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty.
FaB---- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: thin layer.
FrC---- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer.
Fu*: Fluvaquents. Udifluvents.						
GaB---- Galway	Severe: depth to rock, wetness.	Moderate: depth to rock, wetness.	Severe: depth to rock, wetness.	Moderate: slope, depth to rock, wetness.	Moderate: depth to rock, wetness.	Moderate: wetness.
HaB---- Hartland	Slight----	Slight----	Slight----	Moderate: slope.	Severe: frost action.	Slight.
HaC---- Hartland	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: frost action.	Moderate: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HeC---------- Hermon	Severe: cutbanks cave.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope, large stones.	Moderate: small stones, large stones, droughty.
HeE---------- Hermon	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: small stones, large stones, droughty.
HmC*: Hermon----------	Severe: cutbanks cave.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope, large stones.	Moderate: small stones, large stones, droughty.
Lyman----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer, droughty.
Rock outcrop.						
HmE*: Hermon----------	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: small stones, large stones, droughty.
Lyman----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, thin layer, droughty.
Rock outcrop.						
HnA---------- Hinckley	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: small stones, droughty.
HnB---------- Hinckley	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: small stones, droughty.
HnC---------- Hinckley	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.
HpA*: Hinckley---------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: small stones, droughty.
Plainfield-------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
HpC*: Hinckley---------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HpC*: Plainfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
HpE*: Hinckley	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
Plainfield	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HuB--- Hudson	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: frost action, low strength.	Moderate: wetness.
HuC--- Hudson	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: frost action, low strength.	Moderate: wetness, slope.
LmC*: Lyman	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: thin layer, droughty.
Rock outcrop.						
LmE*: Lyman	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, thin layer, droughty.
Rock outcrop.						
LnA, LyA--- Lyme	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Ma--- Madalin	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, low strength, frost action.	Severe: wetness.
MrC--- Marlow	Moderate: dense layer, wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
MrE--- Marlow	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MsA--- Massena	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Mu---------- Middlebury	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness.
OaA---------- Oakville	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
OaB---------- Oakville	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
OaC---------- Oakville	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
Pa---------- Palms	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action, subsides.	Severe: ponding, excess humus.
PbB---------- Paxton	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Slight.
PbC---------- Paxton	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: slope.
PeB---------- Peru	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: large stones, wetness.
Pg*, Ph*. Pits						
PlA---------- Plainfield	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
PlB---------- Plainfield	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
PlC---------- Plainfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
PoE*: Plainfield-------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Oakville---------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ra---------- Raynham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
RhA, RhB---------- Rhinebeck	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action, wetness.	Severe: wetness.
Ro*. Rock outcrop						
Sa*: Saprists.						
Aquepts.						
ScA---------- Schroon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
ScB---------- Schroon	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
SdB---------- Schroon	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Severe: wetness, large stones.
Sh---------- Shaker	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
SoB---------- Stowe	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: small stones.
SoC---------- Stowe	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: small stones, slope.
SoD---------- Stowe	Severe: slope, wetness.	Severe: slope.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Severe: slope.
StC---------- Stowe	Severe: wetness.	Moderate: wetness, slope, large stones.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: small stones, large stones, slope.
StE---------- Stowe	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
SuB---------- Sutton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
To---------- Tioga	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Ud*. Udorthents						

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Wa---------- Wareham	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
WgB---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
WoC*: Woodstock--------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Moderate: small stones, large stones, droughty.
Rock outcrop.						
WoE*: Woodstock--------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Moderate: small stones, large stones, droughty.
Rock outcrop.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AgA Agawam	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
BaA, BaB Belgrade	Severe: wetness, percs slowly.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: wetness.
BcB Bice	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
BcC Bice	Moderate: slope, percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
BcD Bice	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope, small stones.
BdC Bice	Moderate: slope, percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
BdE Bice	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
BeC*: Bice	Moderate: slope, percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
Woodstock	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
BeE*: Bice	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Woodstock	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
Ca Carlisle	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ce---------- Castile	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.
Cg*: Cathro----------	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
Greenwood----------	Severe: ponding.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
ChB---------- Charlton	Slight----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
ChC---------- Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
ChD---------- Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Du*. Dumps					
ElB---------- Elmridge	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: seepage.	Poor: too clayey, hard to pack.
En---------- Elnora	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy.
FaB---------- Farmington	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
FrC---------- Farmington	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
Fu*: Fluvaquents. Udifluvents.					
GaB---------- Galway	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock.	Poor: area reclaim, small stones.
HaB---------- Hartland	Severe: percs slowly.	Moderate: slope, seepage.	Slight----------	Slight----------	Good.
HaC---------- Hartland	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HeC---------- Hermon	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
HeE---------- Hermon	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: small stones, seepage, too sandy.
HmC*: Hermon----------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: small stones, seepage, too sandy.
Lyman----------	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: area reclaim, small stones, thin layer.
Rock outcrop.					
HmE*: Hermon----------	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: small stones, seepage, too sandy.
Lyman----------	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, thin layer, small stones.
Rock outcrop.					
HnA, HnB---------- Hinckley	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage, small stones.
HnC---------- Hinckley	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage, small stones.
HpA*: Hinckley----------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage, small stones.
Plainfield---------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
HpC*: Hinckley----------	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage, small stones.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HpC*: Plainfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
HpE*: Hinckley	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, too sandy, seepage.
Plainfield	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: too sandy, slope, seepage.
HuB---- Hudson	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
HuC---- Hudson	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
LmC*: Lyman	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: area reclaim, small stones, thin layer.
Rock outcrop.					
LmE*: Lyman	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, thin layer, small stones.
Rock outcrop.					
LnA, LyA---- Lyme	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Ma---- Madalin	Severe: percs slowly, wetness.	Slight----	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.
MrC---- Marlow	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
MrE---- Marlow	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MsA---- Massena	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness, small stones.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Mu---------- Middlebury	Severe: flooding, wetness, poor filter.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Poor: wetness.
OaA, OaB---------- Oakville	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
OaC---------- Oakville	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
Pa---------- Palms	Severe: subsides, ponding.	Severe: seepage, excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, seepage.	Poor: ponding, excess humus.
PbB---------- Paxton	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
PbC---------- Paxton	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: small stones, slope, wetness.
PeB---------- Peru	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
Pg*, Ph*. Pits					
PlA, PlB---------- Plainfield	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
PlC---------- Plainfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.
PoE*: Plainfield---------	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: too sandy, slope, seepage.
Oakville----------	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy, slope.	Severe: seepage, slope.	Poor: too sandy, slope, seepage.
Ra---------- Raynham	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
RhA---------- Rhinebeck	Severe: percs slowly, wetness.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
RhB---------- Rhinebeck	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Rc*. Rock outcrop					
Sa*: Saprists.					
Aquepts.					
ScA, ScB---------- Schroon	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: small stones.
SdB---------- Schroon	Severe: wetness.	Severe: wetness, slope.	Severe: wetness.	Severe: wetness.	Poor: small stones.
Sh---------- Shaker	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness, seepage.	Poor: too clayey, wetness, hard to pack.
SoB---------- Stowe	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage.	Poor: small stones.
SoC---------- Stowe	Severe: wetness, percs slowly.	Severe: seepage, slope, wetness.	Severe: wetness.	Severe: seepage.	Poor: small stones.
SoD---------- Stowe	Severe: wetness, percs slowly, slope.	Severe: seepage, slope, wetness.	Severe: wetness, slope.	Severe: seepage, slope.	Poor: small stones, slope.
StC---------- Stowe	Severe: wetness, percs slowly.	Severe: seepage, slope, wetness.	Severe: wetness.	Severe: seepage.	Poor: small stones.
StE---------- Stowe	Severe: wetness, percs slowly, slope.	Severe: seepage, slope, wetness.	Severe: wetness, slope.	Severe: seepage, slope.	Poor: small stones, slope.
SuB---------- Sutton	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: small stones, wetness.
To---------- Tioga	Severe: flooding, wetness, poor filter.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: thin layer.
Ud*. Udorthents					

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Wa---------- Wareham	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
WgB---------- Woodbridge	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
WoC*: Woodstock----------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
Rock outcrop.					
WoE*: Woodstock----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AgA Agawam	Good	Probable	Probable	Poor: too sandy, area reclaim.
BaA, BaB Belgrade	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
BcB, BcC Bice	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BcD Bice	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones, area reclaim.
BdC Bice	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BdE Bice	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones, area reclaim.
BeC*: Bice	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Woodstock	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
BeE*: Bice	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones, area reclaim.
Woodstock	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Ca Carlisle	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Ce Castile	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Cg*:				
Cathro	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Greenwood	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
ChB Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
ChC Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
ChD Charlton	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Du*. Dumps				
ElB Elmridge	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
En Elnora	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
FaB, FrC Farmington	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Fu*: Fluvaquents. Udifluvents.				
GaB Galway	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
HaB Hartland	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
HaC Hartland	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
HeC Hermon	Fair: large stones.	Probable	Probable	Poor: small stones, area reclaim.
HeE Hermon	Poor: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
HmC*: Hermon	Fair: large stones.	Probable	Probable	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HmC*: Lyman	Poor: thin layer, area reclaim.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, area reclaim, thin layer.
Rock outcrop.				
HmE*: Hermon	Poor: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
Lyman	Poor: slope, thin layer, area reclaim.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones, thin layer.
Rock outcrop.				
HnA, HnB, HnC Hinckley	Good	Probable	Probable	Poor: too sandy, area reclaim, small stones.
HpA*, HpC*: Hinckley	Good	Probable	Probable	Poor: too sandy, area reclaim, small stones.
Plainfield	Good	Probable	Improbable: too sandy.	Poor: thin layer.
HpE*: Hinckley	Poor: slope.	Probable	Probable	Poor: slope, too sandy, small stones.
Plainfield	Poor: slope.	Probable	Improbable: too sandy.	Poor: slope, thin layer.
HuB, HuC Hudson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, too clayey.
LmC*: Lyman	Poor: thin layer, area reclaim.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, area reclaim, thin layer.
Rock outcrop.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LmE*: Lyman	Poor: slope, thin layer, area reclaim.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: slope, small stones, thin layer.
Rock outcrop.				
LnA---- Lyme	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
LyA---- Lyme	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
Ma---- Madalin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
MrC---- Marlow	Good----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
MrE---- Marlow	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
MsA---- Massena	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
Mu---- Middlebury	Poor: wetness.	Probable----	Probable----	Poor: small stones, area reclaim, wetness.
OaA, OaB, OaC---- Oakville	Good----	Probable----	Improbable: too sandy.	Poor: too sandy.
Pa---- Palms	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess humus.
PbB---- Paxton	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
PbC---- Paxton	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
PeB---- Peru	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Pg*, Ph*. Pits				
PlA, PlB, PlC---- Plainfield	Good----	Probable----	Improbable: too sandy.	Poor: thin layer.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
PoE*:				
Plainfield	Poor: slope.	Probable	Improbable: too sandy.	Poor: slope, thin layer.
Oakville	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Ra Raynham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
RhA, RhB Rhinebeck	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Ro*. Rock outcrop				
Sa*: Saprists.				
Aquepts.				
ScA, ScB, SdB Schroon	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Sh Shaker	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SoB, SoC Stowe	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SoD Stowe	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
StC Stowe	Fair: large stones, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
StE Stowe	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SuB Sutton	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
To Tioga	Good	Probable	Probable	Poor: small stones, area reclaim.
Ud*. Udorthents				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Wa---------- Wareham	Poor: wetness.	Probable----------	Probable----------	Poor: wetness, too sandy, area reclaim.
WgB---------- Woodbridge	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
WoC*: Woodstock----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Rock outcrop.				
WoE*: Woodstock----------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
AgA---------- Agawam	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy------	Favorable.
BaA---------- Belgrade	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave, slow refill.	Percs slowly, frost action.	Erodes easily, wetness.	Erodes easily, percs slowly.
BaB---------- Belgrade	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave, slow refill.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Erodes easily, percs slowly.
BcB---------- Bice	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable------	Droughty.
BcC, BcD---------- Bice	Severe: slope, seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope----------	Slope, droughty.
BdC, BdE---------- Bice	Severe: slope, seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones, droughty.
BeC*, BeE*: Bice----------	Severe: slope, seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones, droughty.
Woodstock--------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Ca---------- Carlisle	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
Ce---------- Castile	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Droughty.
Cg*: Cathro----------	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
Greenwood--------	Severe: seepage.	Severe: excess humus, ponding.	Moderate: slow refill.	Ponding, frost action.	Ponding--------	Wetness.
ChB---------- Charlton	Severe: seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Favorable------	Favorable.
ChC, ChD---------- Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope----------	Slope.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Du*. Dumps						
ElB---------- Elmridge	Moderate: slope.	Moderate: piping, hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Erodes easily, percs slowly.
En---------- Elnora	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy.	Droughty.
FaB---------- Farmington	Severe: depth to rock.	Severe: piping.	Severe: no water.	Deep to water	Depth to rock	Droughty, depth to rock.
FrC---------- Farmington	Severe: depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, droughty, depth to rock.
Fu*: Fluvaquents.						
Udifluvents.						
GaB---------- Galway	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Depth to rock, slope.	Depth to rock, wetness.	Depth to rock, droughty.
HaB---------- Hartland	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
HaC---------- Hartland	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
HeC, HeE---------- Hermon	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, slope, too sandy.	Large stones, slope, droughty.
HmC*, HmE*: Hermon----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, slope, too sandy.	Large stones, slope, droughty.
Lyman----------	Severe: slope, seepage, depth to rock.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock, droughty.
Rock outcrop.						
HnA, HnB---------- Hinckley	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
HnC---------- Hinckley	Severe: slope, seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Large stones, droughty, slope.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
HpA*:						
Hinckley	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
Plainfield	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty.
HpC*, HpE*:						
Hinckley	Severe: slope, seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Large stones, droughty, slope.
Plainfield	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, too sandy, soil blowing.	Droughty, slope.
HuB---------- Hudson	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Erodes easily, wetness.	Percs slowly, erodes easily.
HuC---------- Hudson	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, erodes easily, wetness.	Slope, percs slowly, erodes easily.
LmC*, LmE*:						
Lyman	Severe: slope, seepage, depth to rock.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock, droughty.
Rock outcrop.						
LnA, LyA---------- Lyme	Severe: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action---	Wetness--------	Wetness.
Ma---------- Madalin	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly, erodes easily.
MrC, MrE---------- Marlow	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, rooting depth, percs slowly.
MsA---------- Massena	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness.
Mu---------- Middlebury	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action, cutbanks cave.	Wetness--------	Wetness.
OaA, OaB---------- Oakville	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty.
OaC---------- Oakville	Severe: seepage, slope.	Severe: piping, seepage.	Severe: no water.	Deep to water	Slope, too sandy, soil blowing.	Slope, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Pa---------- Palms	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Wetness.
PbB---------- Paxton	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Rooting depth, percs slowly.	Rooting depth, percs slowly.
PbC---------- Paxton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, percs slowly.	Slope, rooting depth, percs slowly.
PeB---------- Peru	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Rooting depth, percs slowly.
Pg*, Ph*. Pits						
PlA, PlB---------- Plainfield	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy, soil blowing.	Droughty.
PlC---------- Plainfield	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, too sandy, soil blowing.	Droughty, slope.
PoE*: Plainfield------- Oakville---------	Severe: seepage, slope. Severe: seepage, slope.	Severe: seepage, piping. Severe: piping, seepage.	Severe: no water. Severe: no water.	Deep to water Deep to water	Slope, too sandy, soil blowing. Slope, too sandy, soil blowing.	Droughty, slope. Slope, droughty.
Ra---------- Raynham	Slight---------	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
RhA---------- Rhinebeck	Slight---------	Severe: wetness.	Severe: no water.	Percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
RhB---------- Rhinebeck	Moderate: slope.	Severe: wetness.	Severe: no water.	Slope, percs slowly, frost action.	Erodes easily, wetness.	Wetness, erodes easily.
Ro*. Rock outcrop						
Sa*: Saprists. Aquepts.						
ScA---------- Schroon	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action---	Wetness--------	Droughty.
ScB---------- Schroon	Moderate: seepage, slope.	Severe: piping, wetness.	Moderate: slow refill.	Frost action, slope.	Wetness--------	Droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
SdB---------- Schroon	Severe: slope.	Severe: piping, wetness.	Moderate: slow refill.	Frost action, slope.	Slope, large stones, wetness.	Slope, large stones, droughty.
Sh---------- Shaker	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.
SoB---------- Stowe	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Large stones, erodes easily.	Large stones, erodes easily.
SoC, SoD---------- Stowe	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
StC, StE---------- Stowe	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, large stones, slope.	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
SuB---------- Sutton	Severe: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action, slope.	Wetness--------	Favorable.
To---------- Tioga	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Erodes easily	Erodes easily, droughty.
Ud*. Udorthents						
Wa---------- Wareham	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy.	Wetness, droughty.
WgB---------- Woodbridge	Moderate: slope.	Severe: piping.	Severe: no water.	Percs slowly, frost action, slope.	Wetness, percs slowly.	Rooting depth, percs slowly.
WoC*, WoE*: Woodstock--------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AgA---------- Agawam	0-4	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	65-95	40-65	<25	NP-3
	4-12	Fine sandy loam, very fine sandy loam, loam.	SM, ML	A-4	0	95-100	85-100	65-95	40-65	<25	NP-3
	12-24	Fine sandy loam	SM, SP-SM	A-2, A-3, A-4	0	90-100	85-100	60-95	5-45	<20	NP-3
	24-38	Fine sand, loamy fine sand, loamy sand.	SM, SP-SM	A-2	0	90-100	85-100	40-90	5-35	---	NP
	38-60	Stratified fine sand to very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1, A-2, A-3	0-5	50-100	30-100	15-80	5-35	---	NP
BaA, BaB--------- Belgrade	0-10	Silt loam--------	ML	A-4	0	100	95-100	90-100	60-95	<35	NP-8
	10-42	Silt loam, very fine sandy loam, loamy very fine sand.	ML	A-4	0	100	95-100	85-100	50-90	<35	NP-8
	42-62	Silt loam, loamy very fine sand, sand and gravel.	ML, SM, SC	A-1, A-2, A-4	0	75-100	55-100	35-100	15-90	<35	NP-8
BcB, BcC, BcD---- Bice	0-3	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0-10	85-95	75-90	50-85	25-80	<25	NP-5
	3-22	Sandy loam, gravelly sandy loam, gravelly loam.	SM, ML, GM	A-2, A-4, A-1-B	5-15	60-90	60-90	40-80	20-65	<25	NP-3
	22-60	Gravelly sandy loam, gravelly fine sandy loam, loam.	SM, GM	A-2, A-4, A-1-B	5-15	60-90	60-85	40-75	20-50	---	NP
BdC, BdE--------- Bice	0-3	Very stony fine sandy loam.	SM, ML, CL-ML, SM-SC	A-2, A-4	10-25	75-95	70-90	60-85	30-70	<25	NP-5
	3-22	Sandy loam, gravelly sandy loam, gravelly fine sandy loam.	SM, GM	A-2, A-4, A-1-B	5-15	60-90	60-85	40-75	20-50	---	NP
	22-60	Gravelly sandy loam, gravelly fine sandy loam, loam.	SM, GM	A-2, A-4, A-1-B	5-15	60-90	60-85	40-75	20-50	---	NP
BeC*, BeE*:------ Bice	0-3	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0-10	85-95	75-90	60-85	30-70	<25	NP-5
	3-22	Sandy loam, gravelly sandy loam, gravelly fine sandy loam.	SM, GM	A-2, A-4, A-1-B	5-15	60-90	60-85	40-75	20-50	---	NP-3
	22-60	Gravelly sandy loam, gravelly fine sandy loam, loam.	SM, GM	A-2, A-4, A-1-B	5-15	60-90	60-85	40-75	20-50	---	NP

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BeC*, BeE*:											
Woodstock-------	0-2	Fine sandy loam.	SM, ML, GM	A-4, A-2	5-25	55-100	50-95	35-95	20-85	<20	NP-2
	2-18	Silt loam, gravelly fine sandy loam, channery fine sandy loam.	SM, ML	A-4, A-5, A-2	0-15	70-100	65-95	45-95	25-85	20-50	NP-6
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ca--------------- Carlisle	0-80	Sapric material	PT	A-8	---	---	---	---	---	---	---
Ce--------------- Castile	0-8	Gravelly fine sandy loam.	GM, SM, GM-GC, SM-SC	A-2, A-4, A-1	0-5	55-85	50-75	30-60	15-40	<30	NP-10
	8-32	Very gravelly loam, very gravelly sandy loam, gravelly silt loam.	GM, SM, ML, GM-GC	A-1, A-2, A-4	5-10	40-75	35-70	15-65	5-60	<30	NP-10
	32-60	Very gravelly sand, very gravelly loam, very gravelly loamy sand.	GW, GP, GW-GM, SW-SM	A-1, A-2, A-4	5-10	30-85	25-60	10-45	0-40	---	NP
Cg*:											
Cathro----------	0-4	Sapric material	PT	A-8	0	---	---	---	---	---	---
	4-46	Sapric material, muck.	PT	A-8	0	---	---	---	---	---	---
	46-62	Sandy loam, loam, silt loam.	SM, ML, SC, CL	A-4	0-5	80-100	65-100	60-100	35-90	<25	3-10
Greenwood-------	0-3	Fibric material	PT	A-8	0	---	---	---	---	---	---
	3-60	Hemic material---	PT	A-8	0	---	---	---	---	---	---
ChB, ChC, ChD---- Charlton	0-7	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	75-90	50-85	25-65	<25	NP-5
	7-28	Fine sandy loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	0-15	65-90	60-90	40-80	20-65	<25	NP-3
	28-60	Gravelly sandy loam, gravelly fine sandy loam, loam.	SM, ML	A-2, A-4	5-25	60-90	55-85	40-75	20-50	---	NP
Du*. Dumps											

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
ElB---------- Elmridge	0-8	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	8-23	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	23-60	Silty clay loam, silty clay, clay.	CL, CL-ML	A-6, A-7	0	100	100	90-100	75-95	25-50	5-25
En---------- Elnora	0-10	Loamy fine sand	SM, ML	A-2, A-4	0	100	100	70-95	25-60	---	NP
	10-28	Loamy fine sand, fine sand.	SM	A-2, A-4	0	100	100	70-95	25-45	---	NP
	28-60	Fine sand, loamy fine sand.	SM	A-2, A-4	0	100	100	60-85	20-45	---	NP
FaB, FrC--------- Farmington	0-8	Loam----------	ML, CL, SM, SC	A-2, A-4, A-6	0-5	80-95	75-90	50-85	30-80	20-35	3-15
	8-13	Silt loam, loam, gravelly fine sandy loam.	ML, CL, GM, GC	A-2, A-4, A-6, A-1	0-5	60-95	55-90	35-85	20-80	20-35	3-15
	13-17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Fu*: Fluvaquents.											
Udifluvents.											
GaB---------- Galway	0-9	Loam----------	ML, SM	A-6, A-7	0-5	80-100	75-100	65-100	45-90	35-45	10-15
	9-28	Loam, silt loam, gravelly fine sandy loam.	ML, GM, GM-GC, CL-ML	A-2, A-4, A-1, A-6	0-5	60-95	50-95	35-90	20-75	20-40	3-15
	28-30	Gravelly loam, very gravelly sandy loam, silt loam.	GM, GW-GM, ML, SP-SM	A-2, A-4, A-1, A-3	0-5	20-90	15-85	10-85	5-75	<20	NP-3
	30-34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
HaB, HaC--------- Hartland	0-8	Very fine sandy loam.	ML, CL-ML	A-4	0	100	100	85-100	65-90	<25	NP-5
	8-21	Silt loam, very fine sandy loam.	ML, CL-ML	A-4	0	100	100	85-100	65-90	<25	NP-5
	21-60	Stratified silt loam to very fine sandy loam.	ML, CL-ML	A-4	0	100	100	85-100	65-95	<25	NP-5
HeC, HeE--------- Hermon	0-5	Very stony fine sandy loam.	SM	A-2, A-4, A-1	5-30	70-95	50-90	30-80	15-45	<40	NP-10
	5-25	Very gravelly coarse sand, gravelly fine sandy loam, extremely gravelly sandy loam.	SM, GM	A-2, A-4, A-1	20-30	60-90	30-75	25-60	15-40	<40	NP-10
	25-60	Very gravelly coarse sand, gravelly loamy sand, extremely gravelly sand.	SP-SM, SM, GP-GM, GM	A-1, A-2, A-3	20-40	45-80	25-70	20-55	5-25	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HmC*, HmE*:											
Hermon	0-5	Very stony fine sandy loam.	SM	A-2, A-4, A-1	5-30	70-95	50-90	30-80	15-45	<40	NP-10
	5-25	Very gravelly coarse sand, gravelly fine sandy loam, extremely gravelly sandy loam.	SM, GM	A-2, A-4, A-1	20-30	60-90	30-75	25-60	15-40	<40	NP-10
	25-60	Very gravelly coarse sand, gravelly loamy sand, extremely gravelly sand.	SP-SM, SM, GP-GM, GM	A-1, A-2, A-3	20-40	45-80	25-70	20-55	5-25	---	NP
Lyman	0-2	Very stony fine sandy loam.	SM, ML	A-1, A-2, A-4	5-20	60-80	60-90	35-80	15-75	<30	NP-6
	2-17	Loam, channery fine sandy loam, silt loam.	SM, ML	A-1, A-2, A-4	0-20	55-90	60-90	35-85	20-80	<30	NP-4
	17-21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
HnA, HnB, HnC---- Hinckley	0-4	Gravelly sandy loam.	SM, SP-SM	A-1, A-2, A-3, A-4	0-10	60-95	40-75	20-70	2-40	---	NP
	4-27	Gravelly loamy sand, loamy fine sand, very gravelly loamy coarse sand.	SM, GM, GW-GM, SP-SM	A-1, A-2, A-3	0-20	40-95	30-85	15-70	2-30	---	NP
	27-63	Stratified very gravelly loamy fine sand to cobbly coarse sand.	SP, SP-SM, GW, GW-GM	A-1	5-30	20-65	20-50	10-40	0-20	---	NP
HpA*, HpC*, HpE*:											
Hinckley	0-4	Gravelly sandy loam.	SM, SP-SM	A-1, A-2, A-3, A-4	0-10	60-95	40-75	20-70	2-40	---	NP
	4-27	Gravelly loamy sand, loamy fine sand, very gravelly loamy coarse sand.	SM, GM, GW-GM, SP-SM	A-1, A-2, A-3	0-20	40-95	30-85	15-70	2-30	---	NP
	27-63	Stratified very gravelly loamy fine sand to cobbly coarse sand.	SP, SP-SM, GP, GW-GM	A-1	5-30	20-65	20-50	10-40	0-20	---	NP
Plainfield	0-10	Loamy sand	SM, SP-SM	A-2, A-4, A-1	0	75-100	75-100	40-90	12-40	---	NP
	10-60	Sand	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-70	1-15	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HuB, HuC---------- Hudson	0-14	Silt loam--------	ML, CL-ML, OL, CL	A-4, A-6, A-7	0	95-100	95-100	85-100	65-95	25-48	5-19
	14-30	Silty clay, silty clay loam.	CL, CH	A-7, A-6	0	95-100	90-100	80-100	80-100	35-65	15-35
	30-60	Silty clay, silt loam, clay.	CL, CH, CL-ML	A-7, A-6, A-4	0	95-100	90-100	80-100	60-100	25-65	5-35
LmC*, LmE*:											
Lyman----------	0-2	Very stony fine sandy loam.	SM, ML	A-1, A-2, A-4	5-20	60-80	60-90	35-80	15-75	<30	NP-6
	2-17	Loam, channery fine sandy loam, silt loam.	SM, ML	A-1, A-2, A-4	0-20	55-90	60-90	35-85	20-80	<30	NP-4
	17-21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
LnA---------- Lyme	0-8	Fine sandy loam	ML, CL-ML	A-4, A-6	0-5	90-100	85-95	85-95	70-85	20-40	2-12
	8-25	Loam, sandy loam, gravelly sandy loam.	SM, ML	A-2, A-4	0-15	80-95	70-90	40-80	25-60	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-1, A-2, A-4	0-15	80-95	65-90	35-70	20-45	---	NP
LyA---------- Lyme	0-8	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-15	80-100	70-95	40-95	25-85	<25	NP-3
	8-25	Loam, sandy loam, gravelly sandy loam.	SM, ML	A-2, A-4	0-15	80-95	70-90	40-80	25-60	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM, ML	A-2, A-4	0-15	80-95	65-90	40-80	25-60	<25	NP-3
Ma---------- Madalin	0-6	Silt loam--------	ML, MH, OL, OH	A-6, A-7	0	95-100	95-100	85-100	65-100	35-65	10-25
	6-40	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	95-100	95-100	85-100	70-100	38-65	20-35
	40-60	Silty clay, clay, silty clay loam.	CL, CH	A-6, A-7	0	75-100	70-100	65-100	60-100	35-60	15-35
MrC, MrE---------- Marlow	0-6	Very stony fine sandy loam.	SM, ML, CL-ML	A-2, A-4	5-15	85-100	75-90	50-90	30-80	<30	NP-10
	6-28	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC, CL-ML	A-2, A-4, A-1-B	0-15	75-95	60-90	40-85	20-65	<30	NP-10
	28-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC, CL-ML	A-2, A-4, A-1-B	0-15	70-90	60-85	35-80	20-60	<30	NP-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MsA---------- Massena	0-8	Fine sandy loam--	CL, SC	A-6, A-7	0	80-95	75-90	65-90	45-80	35-45	12-20
	8-24	Gravelly fine sandy loam, gravelly sandy loam, loam.	GC, CL, CL-ML, SM-SC	A-4, A-6, A-2, A-1	0-5	55-95	50-90	35-85	15-65	15-25	5-15
	24-60	Gravelly fine sandy loam, gravelly loam, very gravelly sandy loam.	GC, CL, SC, CL-ML	A-4, A-6, A-2, A-1	0-5	40-95	35-90	20-85	10-65	15-25	5-15
Mu---------- Middlebury	0-10	Fine sandy loam	ML, SM, SM-SC, CL-ML	A-4, A-2	0	80-100	75-100	50-100	30-90	25-35	5-10
	10-60	Silt loam, loam, gravelly fine sandy loam.	ML, SM, SM-SC, CL-ML	A-4, A-2	0	75-100	70-100	50-100	30-85	20-25	2-5
OaA, OaB, OaC---- Oakville	0-8	Loamy fine sand	SM	A-2	0	100	100	55-75	15-25	---	NP
	8-60	Fine sand, sand, loamy fine sand.	SM, SP, SP-SM	A-2, A-3	0	100	95-100	65-95	0-25	---	NP
Pa---------- Palms	0-25	Sapric material	PT	A-8	---	---	---	---	---	---	---
	25-60	Clay loam, silty clay loam, fine sandy loam.	CL-ML, CL	A-4, A-6	0	85-100	80-100	70-95	50-90	25-40	5-20
PbB, PbC---------- Paxton	0-10	Fine sandy loam	SM, ML, SM-SC	A-2, A-4	0-10	80-95	75-90	60-85	30-65	<40	NP-10
	10-31	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	65-90	50-85	25-65	<30	NP-7
	31-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	60-85	50-75	20-60	<30	NP-7
PeB---------- Peru	0-8	Very stony loam	SM, ML, CL-ML, SC	A-2, A-4	5-15	90-100	75-90	50-90	30-80	<30	NP-10
	8-28	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC, CL-ML	A-2, A-4, A-1-B	0-15	75-95	60-90	40-85	20-65	<30	NP-10
	28-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC, CL-ML	A-2, A-4, A-1-B	0-15	70-95	55-95	35-80	20-60	<30	NP-10
Pg*, Ph*. Pits											
P1A, P1B, P1C---- Plainfield	0-10	Loamy sand-------	SM, SP-SM	A-2, A-4, A-1	0	75-100	75-100	40-90	12-40	---	NP
	10-60	Sand-------------	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-70	1-15	---	NP
PoE*: Plainfield------	0-10	Loamy sand-------	SM, SP-SM	A-2, A-4, A-1	0	75-100	75-100	40-90	12-40	---	NP
	10-60	Sand-------------	SP, SM, SP-SM	A-3, A-1, A-2	0	75-100	75-100	40-70	1-15	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PoE*:											
Oakville	0-8	Loamy fine sand	SM	A-2	0	100	100	55-75	15-25	---	NP
	8-60	Fine sand, sand, loamy fine sand.	SM, SP, SP-SM	A-2, A-3	0	100	95-100	65-95	0-25	---	NP
Ra	0-8	Silt loam	ML	A-4	0	100	95-100	80-100	55-95	<25	NP-10
Raynham	8-25	Silt loam, silt, very fine sandy loam.	ML	A-4	0	100	95-100	80-100	55-95	<25	NP-10
	25-60	Silt loam, silt, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	70-95	<25	NP-10
RhA, RhB	0-8	Silt loam	ML, MH, CL, OL	A-6, A-7	0	80-100	75-100	70-100	60-90	30-55	10-25
Rhinebeck	8-28	Silty clay loam, silty clay.	CH, CL	A-7, A-6	0	90-100	85-100	80-100	70-100	30-55	15-30
	28-60	Silty clay loam, silty clay, clay.	CH, CL	A-7, A-6	0	90-100	85-100	80-100	70-100	30-55	15-30
Ro*.											
Rock outcrop											
Sa*:											
Saprists.											
Aquepts.											
ScA, ScB	0-4	Gravelly fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0-5	85-95	75-90	50-85	25-80	<25	NP-5
Schroon	4-25	Gravelly fine sandy loam, sandy loam, loam.	SM, ML, GM	A-2, A-4, A-1-B	5-15	65-90	60-90	40-80	20-65	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly coarse sandy loam.	SM, GM	A-2, A-4, A-1-B	5-15	60-90	60-85	40-75	20-50	---	NP
SdB	0-4	Very bouldery fine sandy loam.	SM, ML, CL-ML, SM-SC	A-2, A-4	10-25	85-95	75-90	50-85	25-80	<25	NP-5
Schroon	4-25	Gravelly fine sandy loam, sandy loam, loam.	SM, ML, GM	A-2, A-4, A-1-B	5-15	65-90	60-90	40-80	20-65	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly coarse sandy loam.	SM, GM	A-2, A-4, A-1-B	5-15	60-90	60-85	40-75	20-50	---	NP
Sh	0-10	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
Shaker	10-36	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-60	---	NP
	36-60	Silty clay, silty clay loam, clay.	CL, CL-ML	A-6, A-7	0	100	95-100	90-100	75-95	25-50	5-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SoB, SoC, SoD---- Stowe	0-8	Fine sandy loam	SM, ML	A-2, A-4	5-10	75-95	65-95	50-85	30-60	<40	NP-10
	8-30	Fine sandy loam, loam, gravelly sandy loam.	SM, ML	A-2, A-4	5-10	75-95	65-95	50-85	25-55	<30	NP-10
	30-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-2, A-4	5-25	65-95	60-90	40-80	25-55	<25	NP-10
StC, StE--------- Stowe	0-8	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	65-95	50-85	30-60	<40	NP-10
	8-30	Fine sandy loam, loam, gravelly sandy loam.	SM, ML	A-2, A-4	5-25	75-95	65-95	50-85	25-55	<30	NP-10
	30-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, GM	A-2, A-4	5-30	65-95	60-90	40-80	25-55	<25	NP-10
SuB---------- Sutton	0-5	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	75-90	50-80	25-65	<25	NP-3
	5-29	Fine sandy loam, loam, gravelly sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-90	40-80	25-65	<25	NP-3
	29-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM, ML	A-2, A-4	5-25	60-90	55-85	40-75	20-50	---	NP
To---------- Tioga	0-10	Fine sandy loam	ML, SM	A-4	0	100	95-100	65-95	40-85	<15	NP-4
	10-28	Silt loam, loam, gravelly fine sandy loam.	SM, GM, ML	A-1, A-2, A-4	0	55-100	50-100	35-90	20-80	<15	NP-2
	28-60	Silt loam, gravelly loam, very gravelly loamy sand.	GW-GM, GM, SM, ML	A-1, A-2, A-4, A-3	0-10	35-100	30-100	15-90	5-80	<15	NP-2
Ud*. Udorthents											
Wa---------- Wareham	0-8	Loamy sand-------	SM, SP-SM	A-1, A-2	0	85-100	75-100	40-85	10-35	---	NP
	8-18	Loamy coarse sand, loamy fine sand, sand.	SM, SP-SM	A-1, A-2, A-3	0	85-100	75-100	35-85	5-35	---	NP
	18-32	Loamy coarse sand, loamy sand, coarse sand.	SM, SP-SM, SP	A-1, A-2, A-3	0	85-100	75-100	25-75	0-30	---	NP
	32-60	Coarse sand, loamy sand, very gravelly sand.	SP, SM, GM, GP	A-1, A-2, A-3	0-3	50-100	25-100	10-75	0-30	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
WgB---------- Woodbridge	0-8	Fine sandy loam	SM, ML, SM-SC	A-2, A-4	0-10	85-95	70-90	60-85	30-65	<40	NP-10
	8-29	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	75-90	65-90	50-85	25-65	<30	NP-7
	29-60	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	60-85	50-75	20-60	<30	NP-7
WoC*, WoE*: Woodstock-------	0-2	Very stony fine sandy loam.	SM, ML, GM	A-4, A-2	5-25	55-100	50-95	35-95	20-85	<20	NP-2
	2-18	Silt loam, gravelly fine sandy loam, channery fine sandy loam.	SM, ML	A-4, A-5, A-2	0-15	70-100	65-95	45-95	25-85	<30	NP-6
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
AgA----------	0-4	4-10	1.10-1.20	2.0-6.0	0.13-0.25	4.5-6.5	Low----------	0.28	3	1-5
Agawam	4-12	1-10	1.20-1.40	2.0-6.0	0.11-0.21	4.5-6.5	Low----------	0.37		
	12-24	1-3	1.30-1.40	2.0-20	0.11-0.18	4.5-6.5	Low----------	0.28		
	24-38	1-2	1.30-1.40	6.0-20	0.01-0.09	4.5-6.5	Low----------	0.17		
	38-60	<1	1.30-1.50	6.0-20	0.01-0.09	4.5-6.5	Low----------	0.10		
BaA, BaB---------	0-10	4-15	0.95-1.15	0.6-2.0	0.18-0.25	4.5-6.5	Low----------	0.49	3	1-5
Belgrade	10-42	4-15	1.10-1.40	0.6-2.0	0.16-0.20	4.5-7.3	Low----------	0.64		
	42-62	2-20	1.20-1.40	0.06-6.0	0.06-0.20	6.1-7.3	Low----------	0.64		
BcB, BcC, BcD----	0-3	3-10	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.24	3	2-5
Bice	3-22	3-8	1.40-1.65	0.6-6.0	0.05-0.20	4.5-6.0	Low----------	0.24		
	22-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.24		
BdC, BdE---------	0-3	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.20	3	2-5
Bice	3-22	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.24		
	22-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.24		
BeC*, BeF*:										
Bice----------	0-3	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.20	3	2-5
	3-22	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.24		
	22-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.24		
Woodstock-------	0-2	3-10	0.60-0.80	2.0-6.0	0.14-0.20	5.1-6.5	Low----------	0.20	2	5-9
	2-18	3-10	0.80-1.50	2.0-6.0	0.14-0.18	5.1-6.5	Low----------	0.20		
	18	---	---	---	---	---	----------	----		
Ca----------	0-80	---	0.13-0.23	0.2-6.0	0.35-0.45	5.6-7.3	----------	----	2	>70
Carlisle										
Ce----------	0-8	4-15	1.10-1.40	0.6-6.0	0.08-0.12	4.5-6.0	Low----------	0.20	3	4-10
Castile	8-32	4-15	1.25-1.55	2.0-6.0	0.05-0.13	4.5-6.0	Low----------	0.17		
	32-60	2-10	1.45-1.65	>6.0	0.01-0.02	5.1-7.3	Low----------	0.17		
Cg*:										
Cathro----------	0-4	---	0.28-0.45	0.2-6.0	0.45-0.55	5.6-7.8	----------	----	2	60-85
	4-46	---	0.15-0.30	0.2-6.0	0.35-0.45	5.6-7.8	----------	----		
	46-62	10-25	1.50-1.70	0.2-2.0	0.11-0.22	6.6-8.4	Low----------	----		
Greenwood-------	0-3	---	0.30-0.40	>6.0	0.55-0.65	3.6-4.4	----------	----	2	55-75
	3-60	---	0.10-0.25	0.6-6.0	0.45-0.55	3.6-4.4	----------	----		
ChB, ChC, ChD----	0-7	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low----------	0.24	3	2-5
Charlton	7-28	3-8	1.40-1.65	0.6-6.0	0.07-0.20	4.5-6.0	Low----------	0.24		
	28-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low----------	0.24		
Du*.										
Dumps	---	---	---	---	---	---	----------	----		---
ElB----------	0-8	2-8	1.05-1.30	2.0-6.0	0.14-0.24	4.5-6.5	Low----------	0.24	3	2-6
Elmridge	8-23	2-8	1.35-1.60	2.0-6.0	0.13-0.22	4.5-6.5	Low----------	0.24		
	23-60	35-60	1.55-1.80	<0.2	0.12-0.18	5.6-7.8	Low----------	0.49		
En----------	0-10	2-10	1.20-1.50	2.0-6.0	0.08-0.16	3.6-6.5	Low----------	0.17	4	2-6
Elnora	10-28	2-5	1.20-1.50	6.0-20	0.06-0.08	3.6-6.5	Low----------	0.17		
	28-60	2-5	1.45-1.65	6.0-20	0.03-0.06	5.1-7.3	Low----------	0.17		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
FaB, FrC---------	0-8	10-27	1.10-1.40	0.6-2.0	0.11-0.19	5.1-6.5	Low----------	0.32	2	2-6
Farmington	8-13	10-27	1.20-1.50	0.6-2.0	0.07-0.18	5.6-7.8	Low----------	0.32		
	13-17	---	---	---	---	---	----------	----		
Fu*:										
Fluvaquents.	---	---	---	---	---	---	----------	----		---
Udifluvents.	---	---	---	---	---	---	----------	----		---
GaB---------	0-9	7-18	1.10-1.40	0.6-2.0	0.15-0.21	5.6-7.3	Low----------	0.32	3	2-6
Galway	9-28	5-18	1.20-1.50	0.6-2.0	0.08-0.19	5.6-7.8	Low----------	0.24		
	28-30	3-18	1.20-1.50	0.6-2.0	0.04-0.14	7.4-8.4	Low----------	0.24		
	30-34	---	---	---	---	---	----------	----		
HaB, HaC---------	0-8	3-10	1.10-1.50	0.6-2.0	0.18-0.30	5.1-7.3	Low----------	0.49	3	3-6
Hartland	8-21	3-10	1.20-1.50	0.6-2.0	0.18-0.26	5.1-7.3	Low----------	0.64		
	21-60	3-16	1.20-1.50	0.2-2.0	0.16-0.21	5.1-7.3	Low----------	0.64		
HeC, HeE---------	0-5	2-6	0.95-1.20	6.0-20	0.07-0.15	3.6-5.5	Low----------	0.10	3	---
Hermon	5-25	2-7	1.00-1.30	6.0-20	0.05-0.10	3.6-6.0	Low----------	0.10		
	25-60	1-4	1.40-1.70	6.0-20	0.02-0.06	5.1-6.0	Low----------	0.10		
HmC*, HmE*:										
Hermon----------	0-5	2-6	0.95-1.20	6.0-20	0.07-0.15	3.6-5.5	Low----------	0.10	3	---
	5-25	2-7	1.00-1.30	6.0-20	0.05-0.10	3.6-6.0	Low----------	0.10		
	25-60	1-4	1.40-1.70	6.0-20	0.02-0.06	5.1-6.0	Low----------	0.10		
Lyman-----------	0-2	2-10	0.75-1.20	2.0-6.0	0.13-0.24	3.6-6.0	Low----------	0.20	2	---
	2-17	2-10	0.90-1.40	2.0-6.0	0.08-0.28	3.6-6.0	Low----------	0.32		
	17-21	---	---	---	---	---	----------	----		
Rock outcrop.	---	---	---	---	---	---	----------	----		---
HnA, HnB, HnC----	0-4	4-8	1.00-1.20	6.0-20	0.03-0.18	3.6-6.0	Low----------	0.17	3	2-7
Hinckley	4-27	1-5	1.20-1.40	6.0-20	0.01-0.10	3.6-6.0	Low----------	0.17		
	27-63	0-3	1.30-1.50	>20	0.01-0.06	3.6-6.0	Low----------	0.10		
HpA*, HpC*, HpE*:										
Hinckley--------	0-4	4-8	1.00-1.20	6.0-20	0.03-0.18	3.6-6.0	Low----------	0.17	3	2-7
	4-27	1-5	1.20-1.40	6.0-20	0.01-0.10	3.6-6.0	Low----------	0.17		
	27-63	0-3	1.30-1.50	>20	0.01-0.06	3.6-6.0	Low----------	0.10		
Plainfield------	0-10	3-7	1.50-1.65	6.0-20	0.09-0.12	5.1-7.3	Low----------	0.17	5	.5-2
	10-60	0-4	1.50-1.65	6.0-20	0.04-0.07	5.1-6.5	Low----------	0.15		
HuB, HuC---------	0-14	20-40	1.00-1.25	0.2-2.0	0.16-0.21	5.1-7.3	Moderate-----	0.49	3	3-6
Hudson	14-30	25-60	1.15-1.40	<0.2	0.13-0.17	5.6-7.8	Moderate-----	0.28		
	30-60	35-60	1.15-1.40	<0.2	0.12-0.20	6.6-8.4	Moderate-----	0.28		
LmC*, LmE*:										
Lyman-----------	0-2	2-10	0.75-1.20	2.0-6.0	0.13-0.24	3.6-6.0	Low----------	0.20	2	---
	2-17	2-10	0.90-1.40	2.0-6.0	0.08-0.28	3.6-6.0	Low----------	0.32		
	17-21	---	---	---	---	---	----------	----		
Rock outcrop.										
LnA---------	0-8	3-10	1.00-1.25	0.6-6.0	0.15-0.24	4.5-5.5	Low----------	0.28	3	3-8
Lyme	8-25	3-10	1.35-1.60	0.6-6.0	0.05-0.15	4.5-5.5	Low----------	0.32		
	25-60	2-7	1.45-1.70	0.6-6.0	0.04-0.16	4.5-5.5	Low----------	0.24		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
LyA----------	0-8	3-10	1.00-1.25	0.6-6.0	0.06-0.24	4.5-5.5	Low----------	0.24	3	---
Lyme	8-25	3-10	1.35-1.60	0.6-6.0	0.05-0.20	4.5-5.5	Low----------	0.32		
	25-60	2-7	1.45-1.70	0.6-6.0	0.04-0.16	4.5-5.5	Low----------	0.24		
Ma----------	0-6	25-55	1.00-1.25	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37	5	4-10
Madalin	6-40	27-60	1.20-1.40	0.06-0.2	0.12-0.13	5.6-7.8	Moderate-----	0.28		
	40-60	40-60	1.15-1.40	<0.2	0.12-0.13	7.4-8.4	Moderate-----	0.28		
MrC, MrE-----	0-6	3-10	1.00-1.30	0.6-2.0	0.10-0.23	3.6-6.0	Low----------	0.20	3	---
Marlow	6-28	3-10	1.30-1.60	0.6-2.0	0.06-0.20	3.6-6.0	Low----------	0.32		
	28-60	3-10	1.70-2.05	0.06-0.6	0.05-0.12	3.6-6.0	Low----------	0.20		
MsA----------	0-8	8-22	1.10-1.40	0.6-2.0	0.14-0.20	5.6-7.3	Low----------	0.28	3	3-8
Massena	8-24	7-18	1.20-1.50	0.06-0.6	0.08-0.15	5.6-7.3	Low----------	0.20		
	24-60	7-18	1.70-1.95	0.06-0.6	0.06-0.14	6.6-8.4	Low----------	0.20		
Mu----------	0-10	5-18	1.15-1.40	0.6-2.0	0.14-0.21	5.1-6.5	Low----------	0.28	5	3-7
Middlebury	10-60	5-18	1.15-1.45	0.6-2.0	0.10-0.20	5.6-7.3	Low----------	0.28		
OaA, OaB, OaC----	0-8	2-14	1.30-1.55	6.0-20	0.09-0.12	5.1-7.3	Low----------	0.17	5	.5-2
Oakville	8-60	0-10	1.30-1.65	6.0-20	0.06-0.10	5.1-7.3	Low----------	0.15		
Pa----------	0-25	---	0.25-0.45	0.2-6.0	0.35-0.45	5.1-7.8	----------	----	2	>75
Palms	25-60	7-35	1.45-1.75	0.2-2.0	0.14-0.22	6.1-8.4	Low----------	----		
PbB, PbC----------	0-10	3-12	1.00-1.25	0.6-2.0	0.10-0.20	4.5-6.0	Low----------	0.24	3	2-5
Paxton	10-31	3-12	1.35-1.60	0.6-2.0	0.08-0.18	4.5-6.0	Low----------	0.32		
	31-60	3-12	1.70-2.00	<0.2	0.05-0.12	4.5-6.0	Low----------	0.24		
PeB----------	0-8	3-10	0.80-1.00	0.6-2.0	0.16-0.24	3.6-6.0	Low----------	0.20	3	---
Peru	8-28	3-10	1.30-1.60	0.6-2.0	0.06-0.20	3.6-6.0	Low----------	0.32		
	28-60	3-10	1.60-2.05	0.06-0.6	0.05-0.12	3.6-6.0	Low----------	0.24		
Pg*, Ph*.	---	---	---	---	---	---	----------	----		
Pits										
PlA, PlB, PlC----	0-10	3-7	1.50-1.65	6.0-20	0.09-0.12	5.1-7.3	Low----------	0.17	5	.5-2
Plainfield	10-60	0-4	1.50-1.65	6.0-20	0.04-0.07	5.1-6.5	Low----------	0.15		
PoE*:										
Plainfield------	0-10	3-7	1.50-1.65	6.0-20	0.09-0.12	5.1-7.3	Low----------	0.17	5	.5-2
	10-60	0-4	1.50-1.65	6.0-20	0.04-0.07	5.1-6.5	Low----------	0.15		
Oakville--------	0-8	2-14	1.30-1.55	6.0-20	0.09-0.12	5.1-7.3	Low----------	0.17	5	.5-2
	8-60	0-10	1.30-1.65	6.0-20	0.06-0.10	5.1-7.3	Low----------	0.15		
Ra----------	0-8	3-16	1.20-1.50	0.6-2.0	0.20-0.30	5.1-7.3	Low----------	0.49	5	3-10
Raynham	8-25	3-16	1.20-1.50	0.2-2.0	0.18-0.26	5.1-7.3	Low----------	0.64		
	25-60	3-16	1.20-1.50	0.06-0.2	0.18-0.22	5.6-7.8	Low----------	0.64		
RhA, RhB----------	0-8	15-40	1.00-1.25	0.2-0.6	0.16-0.21	5.1-7.3	Moderate-----	0.49	3	3-7
Rhinebeck	8-28	35-60	1.20-1.40	0.06-0.2	0.12-0.14	5.1-7.8	Moderate-----	0.28		
	28-60	35-60	1.15-1.40	0.06-0.2	0.12-0.14	6.1-8.4	Moderate-----	0.28		
Ro*.	---	---	---	---	---	---	----------	----		---
Rock outcrop										
Sa*:										
Saprists.	---	---	---	---	---	---	----------	----		
Aquepts.	---	---	---	---	---	---	----------	----		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
ScA, ScB	0-4	3-10	1.00-1.25	0.6-2.0	0.09-0.25	4.5-6.0	Low	0.24	3	2-5
Schroon	4-25	3-8	1.40-1.65	0.6-2.0	0.05-0.20	4.5-6.0	Low	0.24		
	25-60	1-8	1.45-1.65	0.6-2.0	0.04-0.16	5.1-6.5	Low	0.24		
SdB	0-4	3-10	1.00-1.25	0.6-2.0	0.07-0.23	4.5-6.0	Low	0.20	3	2-5
Schroon	4-25	3-8	1.40-1.65	0.6-2.0	0.05-0.20	4.5-6.0	Low	0.24		
	25-60	1-8	1.45-1.65	0.6-2.0	0.04-0.16	5.1-6.5	Low	0.24		
Sh	0-10	2-8	1.00-1.25	2.0-6.0	0.14-0.24	5.1-7.3	Low	0.24	3	2-10
Shaker	10-36	2-8	1.35-1.60	2.0-6.0	0.13-0.22	5.1-7.3	Low	0.24		
	36-60	35-60	1.55-1.80	<0.2	0.12-0.18	5.6-7.3	Low	0.49		
SoB, SoC, SoD	0-8	5-10	0.70-1.00	0.6-6.0	0.10-0.22	5.1-7.3	Low	0.24	3	5-10
Stowe	8-30	5-10	0.80-1.20	0.6-6.0	0.10-0.20	5.1-7.3	Low	0.32		
	30-60	5-12	1.60-1.80	0.06-0.2	0.08-0.12	5.1-7.3	Low	0.32		
StC, StE	0-8	5-10	0.70-1.00	0.6-6.0	0.10-0.18	5.1-7.3	Low	0.20	3	---
Stowe	8-30	5-10	0.80-1.20	0.6-6.0	0.10-0.18	5.1-7.3	Low	0.32		
	30-60	5-12	1.60-1.80	0.06-0.2	0.08-0.12	5.1-7.3	Low	0.32		
SuB	0-5	3-10	1.00-1.25	0.6-6.0	0.09-0.25	4.5-6.0	Low	0.24	3	2-7
Sutton	5-29	3-10	1.35-1.60	0.6-6.0	0.07-0.20	4.5-6.0	Low	0.32		
	29-60	2-6	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.24		
To	0-10	5-18	1.15-1.40	0.6-6.0	0.15-0.21	5.1-7.3	Low	0.37	5	2-6
Tioga	10-28	5-18	1.15-1.45	0.6-6.0	0.07-0.20	5.1-7.3	Low	0.28		
	28-60	3-15	1.25-1.55	0.6-20	0.02-0.20	5.6-7.8	Low	0.28		
Ud*.										
Udorthents	---	---	---	---	---	---	---	---		
Wa	0-8	1-3	1.00-1.20	6.0-20	0.06-0.15	3.6-6.5	Low	0.17	5	2-5
Wareham	8-18	0-3	1.30-1.50	6.0-20	0.03-0.13	3.6-6.5	Low	0.17		
	18-32	0-3	1.40-1.60	6.0-20	0.01-0.13	3.6-6.5	Low	0.17		
	32-60	0-2	1.40-1.60	6.0-20	0.01-0.10	3.6-6.5	Low	0.10		
WgB	0-8	3-12	1.00-1.25	0.6-2.0	0.10-0.20	4.5-6.5	Low	0.24	3	2-6
Woodbridge	8-29	3-12	1.35-1.60	0.6-2.0	0.08-0.18	4.5-6.5	Low	0.32		
	29-60	3-12	1.70-2.00	<0.2	0.05-0.12	4.5-6.5	Low	0.24		
WoC*, WoE*:										
Woodstock	0-2	3-10	0.60-0.80	2.0-6.0	0.14-0.20	5.1-6.5	Low	0.20	2	5-9
	2-18	3-10	0.80-1.50	2.0-6.0	0.14-0.18	5.1-6.5	Low	0.20	2	
	18	---	---	---	---	---	---	---		
Rock outcrop.	---	---	---	---	---	---	---	---		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
AgA---------- Agawam	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
BaA, BaB---------- Belgrade	B	None--------	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	High-----	Moderate	Moderate.
BcB, BcC, BcD, BdC, BdE--------- Bice	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
BeC*, BeE*:												
Bice----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Woodstock--------	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	Moderate.
Ca---------- Carlisle	A/D	None--------	---	---	+.5-1.0	Apparent	Sep-Jun	>60	---	High-----	High-----	Low.
Ce---------- Castile	B	None--------	---	---	1.5-2.0	Apparent	Mar-May	>60	---	High-----	Moderate	Moderate.
Cg*:												
Cathro----------	A/D	None--------	---	---	+1-1.0	Apparent	Nov-Jun	>60	---	High-----	High-----	Low.
Greenwood--------	A/D	None--------	---	---	+1-1.0	Apparent	Sep-Jun	>60	---	High-----	High-----	High.
ChB, ChC, ChD----- Charlton	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Du*. Dumps												
ElB---------- Elmridge	C	None--------	---	---	1.5-3.0	Perched	Nov-May	>60	---	High-----	Moderate	Moderate.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
En---------- Elnora	B	None--------	---	---	1.5-2.0	Apparent	Feb-May	>60	---	Moderate	Low------	Moderate.
FaB, FrC---------- Farmington	C	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	Moderate.
Fu*: Fluvaquents.												
Udifluvents.												
GaB---------- Galway	B	None--------	---	---	1.5-3.0	Perched	Mar-Apr	20-40	Hard	Moderate	Low------	Low.
HaB, HaC---------- Hartland	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Low------	Low.
HeC, HeE---------- Hermon	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
HmC*, HmE*: Hermon----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Lyman----------	C/D	None--------	---	---	>6.0	---	---	8-20	Hard	Moderate	Low------	High.
Rock outcrop.												
HnA, HnB, HnC----- Hinckley	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
HpA*, HpC*, HpE*: Hinckley---------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
Plainfield-------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low------	High.
HuB, HuC---------- Hudson	C	None--------	---	---	1.5-2.0	Perched	Nov-Apr	>60	---	High-----	High-----	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
LmC*, LmE*: Lyman	C/D	None	---	---	>6.0	---	---	8-20	Hard	Moderate	Low	High.
Rock outcrop.												
LnA, LyA---- Lyme	C	None	---	---	0-1.5	Apparent	Nov-May	>60	---	High	Low	High.
Ma---- Madalin	D	None	---	---	0-0.5	Apparent	Nov-Jun	>60	---	High	High	Low.
MrC, MrE---- Marlow	C	None	---	---	2.0-3.5	Perched	Mar-Apr	>60	---	Moderate	Low	Moderate.
MsA---- Massena	C	None	---	---	0.5-1.5	Apparent	Feb-Apr	>60	---	High	Moderate	Moderate.
Mu---- Middlebury	B	Occasional	Brief	Nov-May	0.5-2.0	Apparent	Feb-Apr	>60	---	High	Moderate	Low.
OaA, OaB, OaC---- Oakville	A	None	---	---	>6.0	---	---	>60	---	Low	Low	Moderate.
Pa---- Palms	A/D	None	---	---	+1-1.0	Apparent	Nov-May	>60	---	High	High	Moderate.
PbB, PbC---- Paxton	C	None	---	---	1.5-2.5	Perched	Feb-Apr	>60	---	Moderate	Low	Moderate.
PeB---- Peru	C	None	---	---	1.5-2.5	Perched	Nov-May	>60	---	High	Moderate	Moderate.
Pg*, Ph*. Pits												
PlA, PlB, PlC---- Plainfield	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
PoE*:												
Plainfield	A	None	---	---	>6.0	---	---	>60	---	Low	Low	High.
Oakville	A	None	---	---	>6.0	---	---	>60	---	Low	Low	Moderate.
Ra Raynham	C	None	---	---	0.5-2.0	Apparent	Nov-May	>60	---	High	High	Moderate.
RhA, RhB Rhinebeck	D	None	---	---	0.5-1.5	Perched	Jan-May	>60	---	High	High	Low.
Ro*. Rock outcrop												
Sa*: Saprists.												
Aquepts.												
ScA, ScB, SdB Schroon	B	None	---	---	1.5-2.0	Apparent	Nov-Apr	>60	---	High	Low	High.
Sh Shaker	C	None	---	---	0-1.5	Apparent	Nov-May	>60	---	High	Moderate	Moderate.
SoB, SoC, SoD, StC, StE Stowe	C	None	---	---	1.5-2.5	Perched	Nov-May	>60	---	Moderate	Low	Moderate.
SuB Sutton	B	None	---	---	1.5-2.5	Apparent	Nov-Apr	>60	---	High	Low	High.
To Tioga	B	Occasional	Brief	Nov-May	3.0-6.0	Apparent	Feb-Apr	>60	---	Moderate	Low	Moderate.
Ud*. Udorthents												

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
Wa---------- Wareham	C	None--------	---	---	0-1.5	Apparent	Sep-Jun	>60	---	Moderate	Moderate	High.
WgB---------- Woodbridge	C	None--------	---	---	1.5-2.5	Perched	Nov-May	>60	---	High-----	Low------	Moderate.
WoC*, WoE*: Woodstock--------	C	None--------	---	---	>6.0	---	---	20-40	Hard	Moderate	Low------	Moderate.
Rock outcrop.												

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--ENGINEERING INDEX TEST DATA

[LL means liquid limit; PI,plasticity index; MD, maximum dry density; OM, optimum moisture; LN, linear shrinkage. Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution												Moisture density		
			Percentage passing sieve--								Percentage smaller than--						
	AASHTO	Unified	>3 inch	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm	LL	PI	MD	OM	LN
			Pct											Pct		Lb/ ft3	Pct	Pct
Bice fsl: 1/ (S74NY-113-003)																		
B21, B22------ 3 to 12	A-2-4(00)	SM	5	100	94	88	80	70	52	20	9	3	2	--	NP	89	26	0.0
B3----------12 to 22	A-2-4(00)	SM	5	100	93	89	84	78	66	31	10	2	2	--	NP	110	16	2.5
C----------22 to 60	A-2-4(00)	SM	5	98	92	88	85	80	64	35	17	4	3	--	NP	126	10	1.2
Hinckley cbsl: 2/ (S74NY-113-001)																		
B21---------- 4 to 11	A-1-a(00)	GW-GM	10	92	53	44	40	38	21	8	--	--	--	--	NP	117	14	2.8
B22----------11 to 21	A-1-a(00)	GW-GM	10	91	62	53	47	44	23	9	--	--	--	--	NP	116	14	2.4
B3----------21 to 27	A-1-b(00)	SP	10	98	91	87	83	80	27	2	--	--	--	--	NP	116	16	0.0
C1----------27 to 49	A-1-a(00)	GW	10	92	54	40	32	25	8	1	--	--	--	--	NP	133	8	0.0
C2----------49 to 63	A-1-b(00)	SP	10	98	79	72	67	61	20	2	--	--	--	--	NP	122	11	0.0
Hudson sil: 3/ (S74NY-113-008)																		
Ap---------- 0 to 7	A-7-5(16)	OL	0	100	100	100	100	100	99	96	73	48	27	48	16	84	32	8.0
B&A---------- 7 to 14	A-7-6(15)	ML	0	100	100	100	100	100	100	99	77	57	46	44	17	93	28	8.4
B21t----------14 to 21	A-7-6(16)	CL	0	100	100	100	100	100	100	99	79	63	48	45	22	92	28	11.0
B22t----------21 to 30	A-7-6(16)	CL	0	100	100	100	100	100	100	99	89	65	47	45	21	94	28	8.2
C----------30 to 60	A-4 (10)	ML-CL	0	100	100	100	99	98	97	96	76	31	18	28	6	104	20	5.0

See footnotes at end of table.

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution										LL	PI	Moisture density		LN
			Percentage passing sieve--							Percentage smaller than--							
	AASHTO	Unified	>3 inch	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			MD	OM	
			Pct											Pct		Lb/ ft3	Pct	Pct
Marlow vbfsl: 4/ (S74NY-113-011)																		
A1---------- 0 to 4	A-4 (00)	SM	15	97	92	89	85	83	72	41	24	3	3	--	NP	81	32	0.0
B22----------12 to 18	A-4 (00)	SM	15	100	92	87	82	76	61	24	6	2	2	--	NP	101	23	0.0
B3----------18 to 28	A-4 (00)	SM	15	90	84	80	75	69	55	22	5	1	1	--	NP	124	11	0.0
Cx----------28 to 60	A-4 (00)	SM	15	93	84	80	75	69	55	22	5	1	1	--	NP	132	9	0.0
Oakville lfs: 5/ (S74NY-113-004)																		
B21---------- 8 to 14	A-3 (00)	SP-SM	0	100	100	100	100	100	86	5	--	--	--	--	NP	109	15	0.0
B22----------14 to 27	A-3 (00)	SP-SM	0	100	100	100	100	100	85	5	--	--	--	--	NP	109	15	0.0
C1----------27 to 45	A-3 (00)	SP-SM	0	100	100	100	100	100	85	6	--	--	--	--	NP	111	15	0.0
C2----------45 to 60	A-2-4(00)	SP-SM	0	100	100	100	100	100	88	12	--	--	--	--	NP	109	14	0.0
Plainfield ls: 6/ (S74NY-113-010)																		
Ap---------- 0 to 10	A-2-4(00)	SM	0	100	100	100	100	99	72	13	--	--	--	--	NP	107	17	0.0
B21----------10 to 20	A-3 (00)	SP-SM	0	100	100	100	99	98	70	5	--	--	--	--	NP	110	16	0.0
B22----------20 to 25	A-3 (00)	SP	0	100	100	100	100	98	66	2	--	--	--	--	NP	110	17	0.0
C1----------25 to 37	A-3 (00)	SP	0	100	100	100	100	100	74	1	--	--	--	--	NP	109	15	0.0
C2----------37 to 60	A-3 (00)	SP	0	100	100	100	99	99	72	1	--	--	--	--	NP	105	16	0.0

See footnotes at end of table.

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution												Moisture density		
			Percentage passing sieve--								Percentage smaller than--						
	AASHTO	Unified	>3 inch	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm	LL	PI	MD	OM	LN
			Pct											Pct		Lb/ ft3	Pct	Pct
Rhinebeck sil: 7/ (S74NY-113-007)																		
Ap---------- 0 to 8	A-7-5(12)	OL	0	100	100	100	100	98	95	84	54	24	14	45	11	83	33	7.0
B21t---------- 8 to 17	A-6 (09)	CL	0	100	100	100	100	98	95	78	60	40	28	35	19	101	22	7.8
B22t----------17 to 28	A-7-5(12)	CL	0	100	100	100	100	100	98	87	53	47	39	42	21	109	17	11.0
Stowe fsl: 8/ (S74NY-113-014)																		
Ap---------- 0 to 8	A-4 (00)	SM	5	99	95	92	89	88	70	38	15	3	2	--	NP	97	21	0.0
B22---------- 8 to 23	A-2-4(00)	SM	5	100	96	93	90	85	60	31	8	2	1	--	NP	120	13	0.0
A12----------23 to 30	A-2-4(00)	SM	5	100	98	95	92	88	67	31	5	2	1	--	NP	125	10	0.0
Cx----------30 to 58	A-2-4(00)	SM	5	100	100	99	98	92	73	35	10	4	1	--	NP	126	10	0.0
Woodbridge fsl: 9/ (S74NY-113-009)																		
A1---------- 0 to 8	A-4 (00)	SM	10	96	91	89	84	80	72	45	14	2	--	--	NP	106	15	2.4
B21---------- 8 to 14	A-2-4(00)	SM	10	98	93	90	86	80	63	34	10	4	3	--	NP	116	14	2.0
B22----------14 to 23	A-2-4(00)	SM	10	98	97	95	90	87	64	29	10	3	1	--	NP	126	10	1.4
B3----------23 to 29	A-2-4(00)	SM	10	100	97	95	91	83	67	30	10	4	2	--	NP	126	10	1.0
Cx----------29 to 58	A-2-4(00)	SM	10	100	98	96	93	84	68	33	10	4	--	--	NP	127	11	0.8

See footnotes at end of table.

TABLE 18.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution											LL	PI	Moisture density		LN
			Percentage passing sieve--								Percentage smaller than--							
	AASHTO	Unified	>3 inch	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			MD	OM	
			Pct											Pct		Lb/ ft3	Pct	Pct
Woodstock fsl: 10/ (S74NY-113-002)																		
B21---------- 5 to 18	A-2-4(00)	SM	0	100	96	92	88	84	66	31	9	3	2	--	NP	98	24	0.0

1/ Bice fine sandy loam: town of Queensbury, 1,500 feet southeast of Wilkie Reservoir, 100 feet north of Halfway Creek.

2/ Hinckley cobbly sandy loam: town of Thurman, 2,000 feet north of intersection of Buyce Cross Road and River Road, 100 feet east of River Road, in a gravel pit.

3/ Hudson silt loam: town of Queensbury, 1,850 feet east of intersection of State Route 9L and Hicks Road, 900 feet south of Hicks Road.

4/ Marlow very bouldery fine sandy loam: town of Johnsburg, 1,000 feet southeast of Gore Mountain Ski Lodge, 400 feet east of Gore Mountain Ski Lodge parking lot.

5/ Oakville loamy fine sand: town of Queensbury, 3,600 feet east of the intersection of New York Route 254 and Dixon Road, 400 feet south of Dixon Road.

6/ Plainfield loamy sand: town of Warrensburg, 100 feet east of U.S. Route 9, 2,000 feet north of County Route 28.

7/ Rhinebeck silt loam: town of Queensbury, 1,850 feet east of intersection of State Route 9L and Hicks Road, 350 feet south of Hicks Road.

8/ Stowe fine sandy loam: town of Horicon, 2,200 feet west of intersection of Jim Younes Road and Duell Hill Road, 390 feet south of the end of Jim Younes Road.

9/ Woodbridge fine sandy loam: town of Queensbury, 4,200 feet northeast of Quaker Road, 500 feet northwest of State Route 9L.

10/ Woodstock fine sandy loam: town of Lake George, 500 feet west of junction of Truesdale Hill Road and Flat Rock Road, 250 feet south of Truesdale Hill Road.

TABLE 19.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Agawam	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Aquepts	Aquepts
Belgrade	Coarse-silty, mixed, mesic Aquic Dystric Eutrochrepts
Bice	Coarse-loamy, mixed, frigid Typic Dystrochrepts
Carlisle	Euic, mesic Typic Medisaprists
Castile	Loamy-skeletal, mixed, mesic Aquic Dystrochrepts
Cathro	Loamy, mixed, euic Terric Borosaprists
Charlton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Elmridge	Coarse-loamy over clayey, mixed, mesic Aquic Dystric Eutrochrepts
Elnora	Mixed, mesic Aquic Udipsamments
Farmington	Loamy, mixed, mesic Lithic Eutrochrepts
Fluvaquents	Fluvaquents
Galway	Coarse-loamy, mixed, mesic Typic Eutrochrepts
Greenwood	Dysic Typic Borohemists
Hartland	Coarse-silty, mixed, mesic Dystric Eutrochrepts
*Hermon	Sandy-skeletal, mixed, frigid Typic Haplorthods
Hinckley	Sandy-skeletal, mixed, mesic Typic Udorthents
Hudson	Fine, illitic, mesic Glossaquic Hapludalfs
Lyman	Loamy, mixed, frigid Lithic Haplorthods
Lyme	Coarse-loamy, mixed, acid, frigid Aeric Haplaquepts
Madalin	Fine, illitic, mesic Mollic Ochraqualfs
Marlow	Coarse-loamy, mixed, frigid Typic Haplorthods
Massena	Coarse-loamy, mixed, nonacid, mesic Aeric Haplaquepts
Middlebury	Coarse-loamy, mixed, mesic Fluvaquentic Eutrochrepts
Oakville	Mixed, mesic Typic Udipsamments
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
Paxton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Peru	Coarse-loamy, mixed, frigid Aquic Haplorthods
Plainfield	Mixed, mesic Typic Udipsamments
Raynham	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Rhinebeck	Fine, illitic, mesic Aeric Ochraqualfs
Saprists	Saprists
Schroon	Coarse-loamy, mixed, frigid Typic Dystrochrepts
Shaker	Coarse-loamy over clayey, mixed, nonacid, mesic Aeric Haplaquepts
*Stowe	Coarse-loamy, mixed, frigid Entic Fragiorthods
Sutton	Coarse-loamy, mixed, mesic Aquic Dystrochrepts
Tioga	Coarse-loamy, mixed, mesic Dystric Fluventic Eutrochrepts
Udifluvents	Udifluvents
Udorthents	Udorthents
Wareham	Mixed, mesic Humaqueptic Psammaquents
Woodbridge	Coarse-loamy, mixed, mesic Aquic Dystrochrepts
*Woodstock	Coarse-loamy, mixed, frigid Typic Haplorthods

*The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series

TABLE 20.-- RELATIONSHIPS BETWEEN PARENT MATERIAL, LANDSCAPE POSITION, AND DRAINAGE OF SOILS (DRAINAGE SEQUENCE)

Parent material and soil characteristics	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
SOILS ON UPLAND TILL PLAINS AT AN ELEVATION ABOVE ABOUT 1,500 FEET							
Deep, brownish soils that have a moderately coarse textured and medium textured subsoil and a firm, compact substratum; formed in glacial till derived from granite and gneiss			Marlow	Peru			
Deep, brownish soils that have a moderately coarse textured subsoil; formed in glacial till derived from granite and gneiss		Hermon	Hermon				
Shallow, reddish and brownish soils that have a moderately coarse textured and medium textured subsoil; formed in glacial till over granitic bedrock		Lyman					
SOILS ON UPLAND TILL PLAINS AT AN ELEVATION OF ABOUT 1,000 to 1,500 FEET							
Deep, brownish soils that have a moderately coarse textured subsoil and a firm, compact substratum; formed in glacial till derived from schist and gneiss			Stowe	Stowe			
Deep, brownish soils that have a moderately coarse textured and medium textured subsoil and substratum; formed in glacial till derived from schist and gneiss			Bice	Schroon		Lyme	
Shallow, brownish soils that have a moderately coarse textured subsoil; formed in glacial till over gneiss and granitic bedrock	Woodstock	Woodstock					
SOILS ON UPLAND TILL PLAINS AT AN ELEVATION LOWER THAN ABOUT 1,000 FEET							
Deep, brownish soils that have a moderately coarse textured and medium textured subsoil and firm, compact substratum; formed in glacial till derived from schist, gneiss, and slate			Paxton	Woodbridge			

TABLE 20.--RELATIONSHIPS BETWEEN PARENT MATERIAL, LANDSCAPE POSITION, AND DRAINAGE OF SOILS (DRAINAGE SEQUENCE)

Parent material and soil characteristics	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
SOILS ON UPLAND TILL PLAINS AT AN ELEVATION LOWER THAN ABOUT 1,000 FEET							
Deep, brownish soils that have a moderately coarse textured and medium textured subsoil and substratum; formed in glacial till derived from schist, gneiss, slate.			Charlton	Sutton	Massena	Massena	
Moderately deep, brownish soils that have a medium textured and moderately coarse textured subsoil and substratum; formed in glacial till over limestone bedrock			Galway	Galway			
Shallow, brownish soils that have a medium textured and moderately coarse textured subsoil; formed in glacial till over limestone bedrock		Farmington	Farmington				
SOILS ON LACUSTRINE PLAINS AND ALLUVIAL TERRACES							
Deep, soils that have a grayish and brownish moderately fine textured subsoil and fine textured substratum; formed in lacustrine deposits				Hudson	Rhinebeck	Madalin	Madalin
Deep, brownish soils that have a medium textured subsoil and substratum; formed in lacustrine deposits			Hartland	Belgrade		Raynham	
Deep, brownish soils that have a moderately coarse textured and medium textured subsoil; formed in fluvial material over fine textured lacustrine deposits				Elmridge		Shaker	
SOILS ON OUTWASH PLAINS, TERRACES, AND DELTAS							
Deep, brownish soils that have a coarse textured subsoil; formed in fluvial material over sand and gravel	Hinckley						
Deep, brownish soils that have a moderately coarse textured and medium textured subsoil; formed in fluvial material over sand and gravel			Aqawam	Castile			

TABLE 20.-- RELATIONSHIPS BETWEEN PARENT MATERIAL, LANDSCAPE POSITION, AND DRAINAGE OF SOILS (DRAINAGE SEQUENCE)

Parent material and soil characteristics	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
	SOILS ON OUTWASH PLAINS, TERRACES, AND DELTAS						
Deep, brownish soils that have a coarse textured subsoil; formed in fluvial material over sand	Plainfield		Oakville	Elnora	Wareham	Wareham	
	SOILS ON FLOOD PLAINS						
Deep, brownish soils that have a medium and moderately coarse textured subsoil and substratum; formed in alluvial sediments			Tioga	Middlebury	Middlebury		
Deep, brownish and grayish soils that have a coarse textured to moderately fine substratum; formed in alluvial sediment			Udifluvents	Udifluvents	Fluvquents	Fluvquents	Fluvquents
	SOILS IN BOGS AND SWAMPS						
Deep, well decomposed organic more than 51 inches thick							Carlisle
Deep, well decomposed organic material 16 to 51 inches thick							Palms
Deep, moderately decomposed organic material more than 51 inches thick, at high altitude							Greenwood
Deep, well decomposed organic material 16 to 51, inches thick at high altitude							Cathro
Deep, variable, well decomposed organic material more than 16 inches thick and ponded							Saprists
Deep, variable, moderately coarse textured, mineral material that is ponded							Aquepts
	SOILS ON TILL PLAINS, OUTWASH PLAINS, AND TERRACES DISTURBED BY MAN						
Deep soils that have a medium textured to coarse textured substratum; formed in mixed mineral material	Udorthents	Udorthents	Udorthents	Udorthents			

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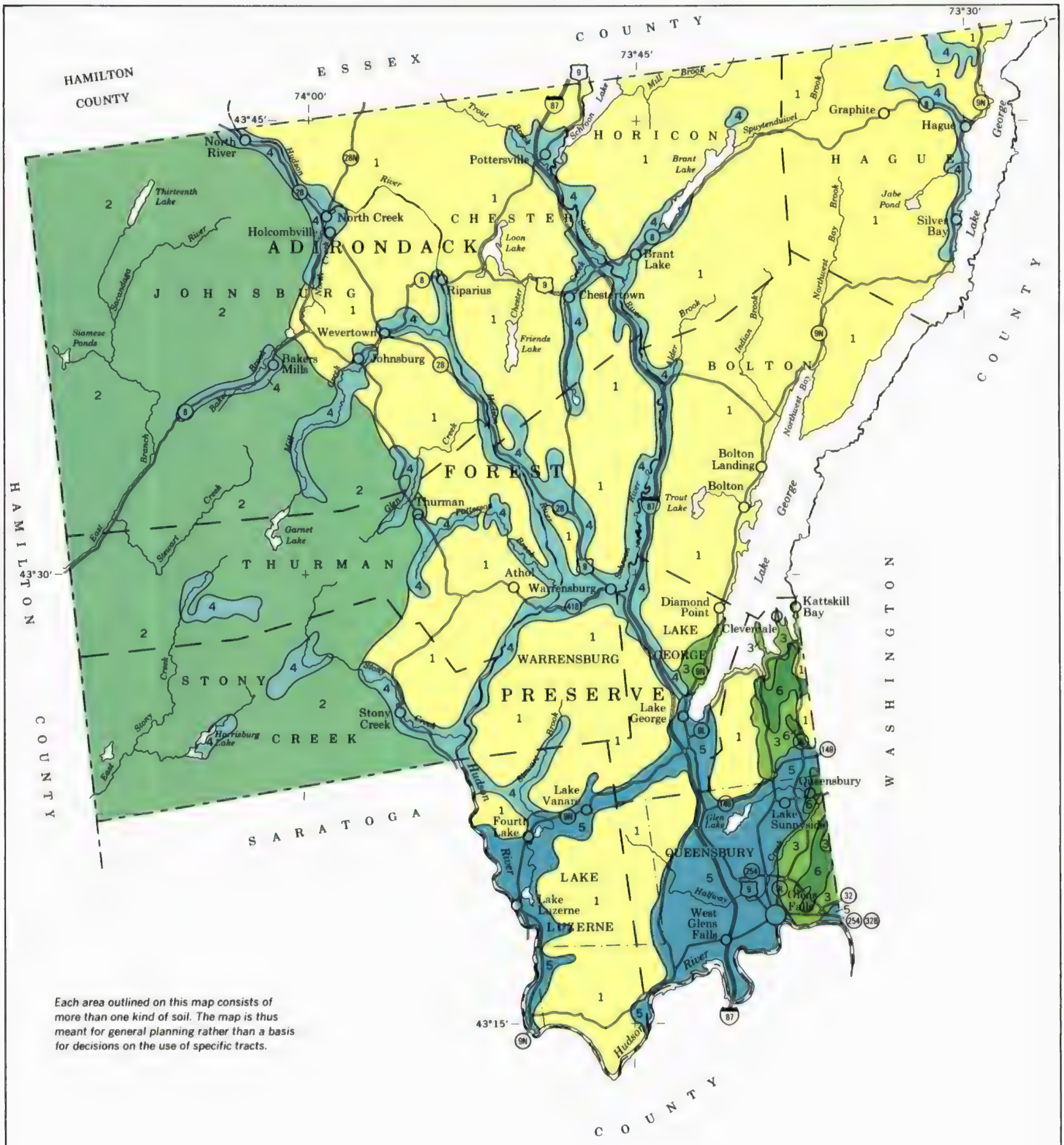

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND

1 — BICE-WOODSTOCK: Sloping to steep, deep and shallow, well drained to excessively drained, moderately coarse textured soils; on uplands at an elevation of about 1,000 to 1,500 feet

2 — HERMON-MARLOW: Sloping to steep, deep, somewhat excessively drained and well drained, moderately coarse textured soils; on uplands at an elevation higher than about 1,500 feet

3 — CHARLTON: Gently sloping, deep, well drained, moderately coarse textured soils; on uplands at an elevation lower than about 1,000 feet

4 — HINCKLEY-PLAINFIELD: Gently sloping and sloping, deep, excessively drained, moderately coarse textured and coarse textured soils; on outwash plains

5 — OAKVILLE: Nearly level and gently sloping, deep, well drained, coarse textured soils; on outwash plains

6 — CARLISLE-MADALIN-HUDSON-RHINEBECK: Nearly level, deep, very poorly drained, organic soils; in bogs and swamps; and nearly level to sloping, deep, very poorly drained to moderately well drained, medium textured, mineral soils; on lake plains

COMPILED 1986

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION

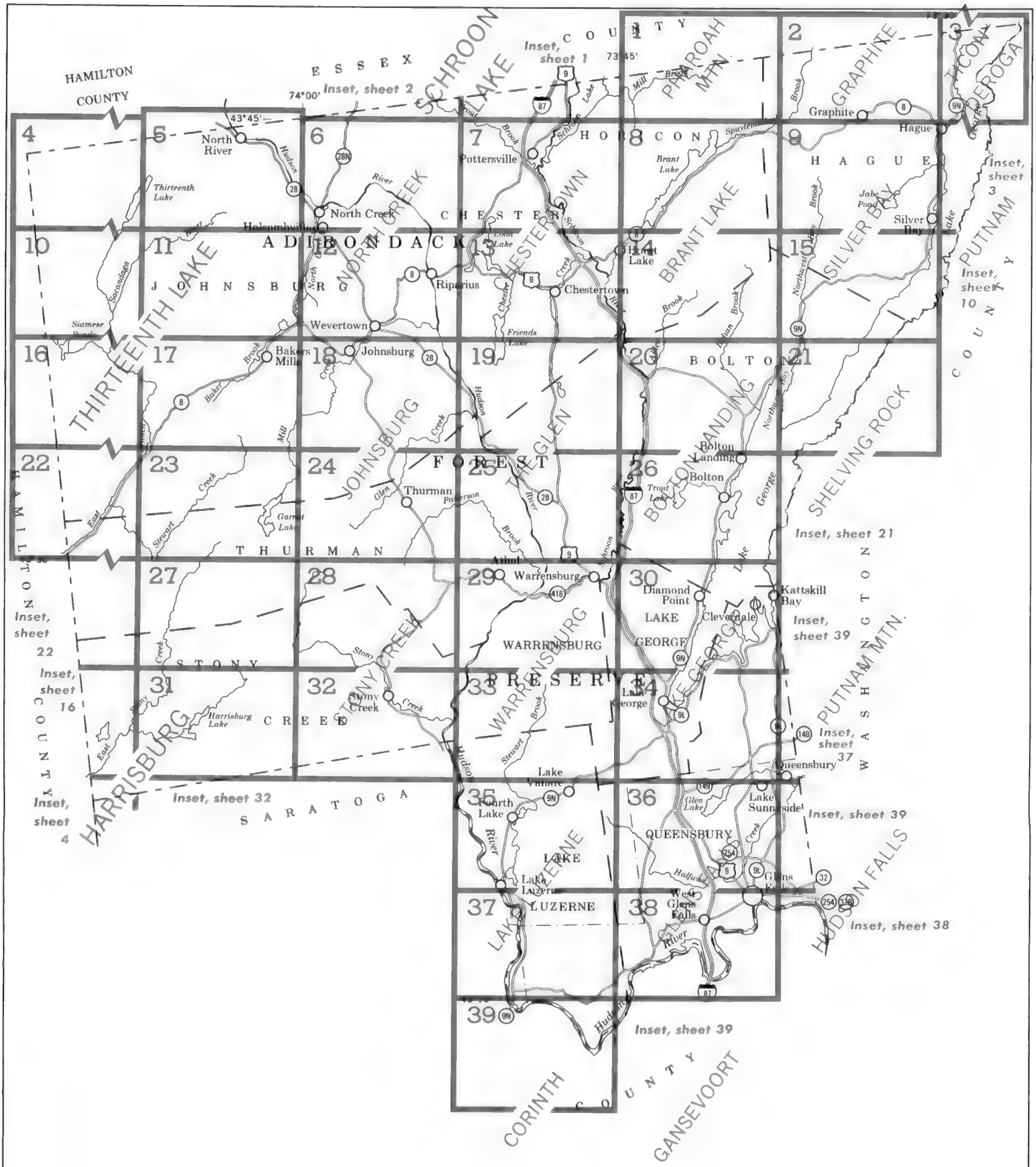
GENERAL SOIL MAP

WARREN COUNTY, NEW YORK

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km



INDEX TO MAP SHEETS

WARREN COUNTY, NEW YORK

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

SOIL LEGEND

Publications symbols consist of letters. The first letter, always a capital, is the initial letter of the soil name. The second letter is lower case and separates map units, other than those based on slope, having names that begin with the same letter. The third letter, always a capital A, B, C, D, or E, indicates the slope. Symbols without a slope letter are for nearly level soils, soils named for taxa of higher categories, or for miscellaneous areas.

SYMBOL	NAME
AgA	Agawam fine sandy loam, 0 to 3 percent slopes
BaA	Belgrade silt loam, 0 to 3 percent slopes
BaB	Belgrade silt loam, 3 to 8 percent slopes
BcB	Bice fine sandy loam, 3 to 8 percent slopes
BcC	Bice fine sandy loam, 8 to 15 percent slopes
BcD	Bice fine sandy loam, 15 to 25 percent slopes
BdC	Bice very bouldery fine sandy loam, sloping
BdE	Bice very bouldery fine sandy loam, steep
BeC	Bice-Woodstock very bouldery fine sandy loams, sloping
BeE	Bice-Woodstock very bouldery fine sandy loams, steep
Ca	Carlisle muck
Ce	Castile gravelly fine sandy loam
Cg	Cathro and Greenwood mucks
ChB	Charlton fine sandy loam, 3 to 8 percent slopes
ChC	Charlton fine sandy loam, 8 to 15 percent slopes
ChD	Charlton fine sandy loam, 15 to 25 percent slopes
Du	Dumps, mine
ElB	Elmridge fine sandy loam, 3 to 8 percent slopes
En	Elnora loamy fine sand
FaB	Farmington loam, 0 to 8 percent slopes
FrC	Farmington loam, very rocky, 3 to 15 percent slopes
Fu	Fluvaquents-Udifluvents complex, frequently flooded
GaB	Galway loam, 3 to 8 percent slopes
HaB	Hartland very fine sandy loam, 3 to 8 percent slopes
HaC	Hartland very fine sandy loam, 8 to 15 percent slopes
HeC	Hermon very bouldery fine sandy loam, sloping
HeE	Hermon very bouldery fine sandy loam, steep
HmC	Hermon-Lyman Rock outcrop complex, sloping
HmE	Hermon-Lyman-Rock outcrop complex, steep
HnA	Hinckley cobbly sandy loam, 0 to 3 percent slopes
HnB	Hinckley cobbly sandy loam, 3 to 8 percent slopes
HnC	Hinckley cobbly sandy loam, 8 to 15 percent slopes
HpA	Hinckley-Plainfield complex, level
HpC	Hinckley-Plainfield complex, sloping
HpE	Hinckley-Plainfield complex, steep
HuB	Hudson silt loam, 3 to 8 percent slopes
HuC	Hudson silt loam, 8 to 15 percent slopes
LmC	Lyman-Rock outcrop complex, sloping
LmE	Lyman-Rock outcrop complex, steep
LnA	Lyme fine sandy loam, 0 to 3 percent slopes
LyA	Lyme very stony fine sandy loam, nearly level
Ma	Madalin silt loam
MrC	Marlow very bouldery fine sandy loam, sloping
MrE	Marlow very bouldery fine sandy loam, steep
MsA	Massena fine sandy loam, 0 to 3 percent slopes
Mu	Middlebury fine sandy loam
OaA	Oakville loamy fine sand, 0 to 3 percent slopes
OaB	Oakville loamy fine sand, 3 to 8 percent slopes
OaC	Oakville loamy fine sand, 8 to 15 percent slopes
Pa	Palms muck
PbB	Paxton fine sandy loam, 3 to 8 percent slopes
PbC	Paxton fine sandy loam, 8 to 15 percent slopes
PeB	Peru very bouldery loam, gently sloping
Pg	Pits, sand & gravel
Ph	Pits, quarry
PlA	Plainfield loamy sand, 0 to 3 percent slopes
PlB	Plainfield loamy sand, 3 to 8 percent slopes
PlC	Plainfield loamy sand, 8 to 15 percent slopes
PoE	Plainfield and Oakville soils, steep
Ra	Raynham silt loam
RhA	Rhinebeck silt loam, 0 to 3 percent slopes
RhB	Rhinebeck silt loam, 3 to 8 percent slopes
Ro	Rock outcrop
Sa	Saprists and Aquepts, inundated
ScA	Schroon gravelly fine sandy loam, 0 to 3 percent slopes
ScB	Schroon gravelly fine sandy loam, 3 to 8 percent slopes
SdB	Schroon very bouldery fine sandy loam, gently sloping
Sh	Shaker fine sandy loam
SoB	Stowe fine sandy loam, 3 to 8 percent slopes
SoC	Stowe fine sandy loam, 8 to 15 percent slopes
SoD	Stowe fine sandy loam, 15 to 25 percent slopes
StC	Stowe very bouldery fine sandy loam, sloping
StE	Stowe very bouldery fine sandy loam, steep
SuB	Sutton fine sandy loam, 3 to 8 percent slopes
To	Tioga fine sandy loam
Ud	Udorthents, smoothed
WaA	Wareham loamy sand, 0 to 3 percent slopes
WgB	Woodbridge fine sandy loam, 3 to 8 percent slopes
WoC	Woodstock-Rock outcrop complex, sloping
WoE	Woodstock Rock outcrop complex, steep

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline
- AD HOC BOUNDARY (label)
- Small airport, airfield, park, oilfield, cemetery, or flood pool
- STATE COORDINATE TICK
- LAND DIVISION CORNER (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate (21)
- Federal (173)
- State (28)
- County, farm or ranch (1283)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
- Double-line (label) — CANAL
- Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, wet
- Intermittent — int

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

- SOIL DELINEATIONS AND SYMBOLS — En, StE
- ESCARPMENTS
  - Bedrock (points down slope)
  - Other than bedrock (points down slope)
- SHORT STEEP SLOPE
- GULLY
- DEPRESSION OR SINK
- SOIL SAMPLE (normally not shown) — S
- MISCELLANEOUS
  - Blowout
  - Clay spot
  - Gravelly spot
  - Gumbo, slick or scabby spot (sodic)
  - Dumps and other similar non soil areas
  - Prominent hill or peak
  - Rock outcrop (includes sandstone and shale)
  - Saline spot
  - Sandy spot
  - Severely eroded spot
  - Slide or slip (tips point upslope)
  - Stony spot, very stony spot

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 1

N

630 000 FEET

73°45'00"

ESSEX COUNTY

Green Hill

Catamount Hill

CHESTER

HORICON

Taylors Point

Adirondack

Park Mountain

Number 8 Mountain

Little Stevens

Stevens Mountain

Crab Pond

Chub Pond

Third Brother

Second Brother

APPROXIMATE BOUNDARY

LAKE SCHROON

Hudson River

(Joins inset, sheet 2)

(Joins inset, sheet 1)

(Joins sheet 7)

(Joins sheet 8)

650 000 FEET

660 000 FEET

43°45'00"

73°52'30"

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

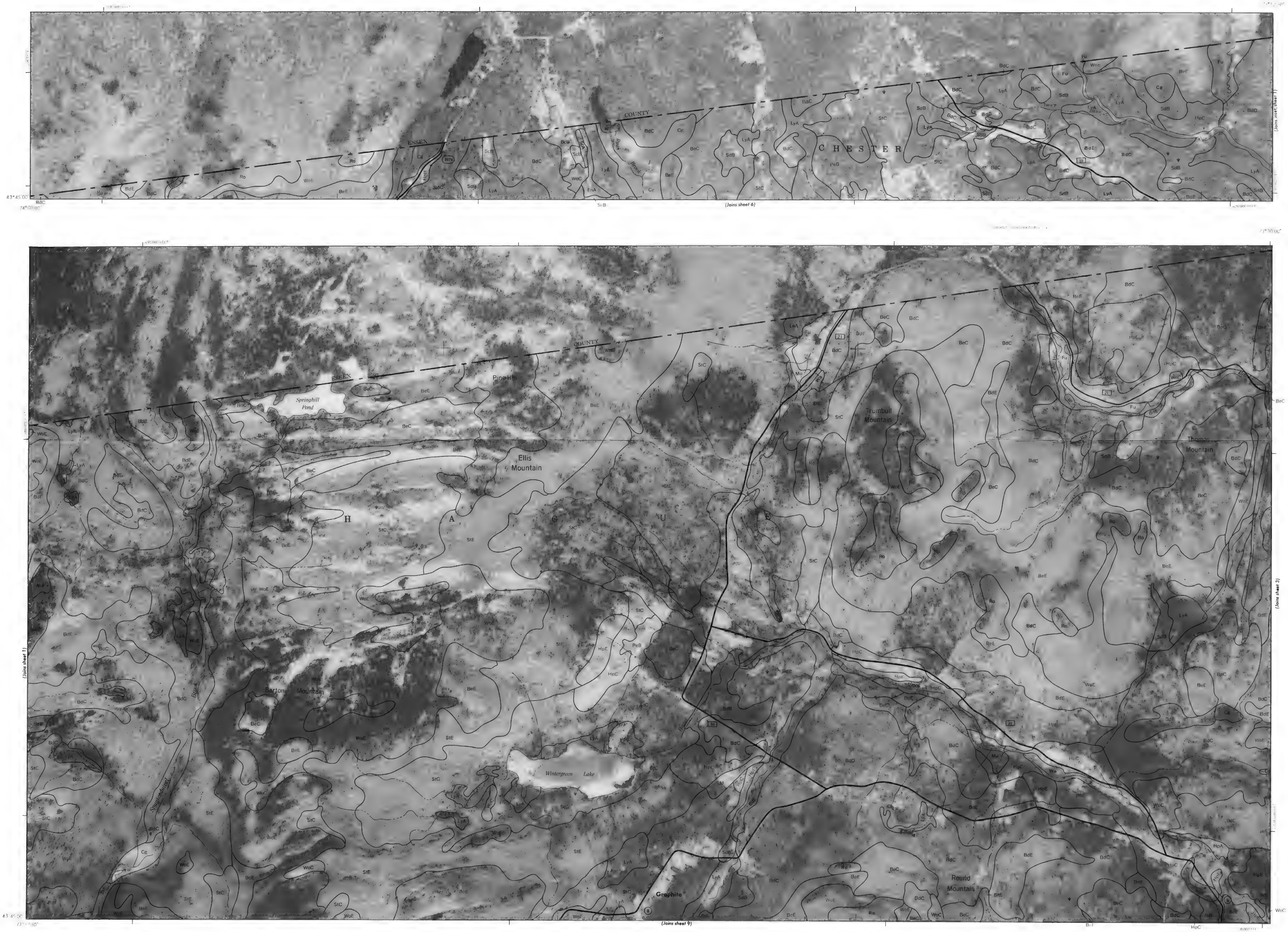
1000 Meters 800 600 400 200 0 1 Kilometer

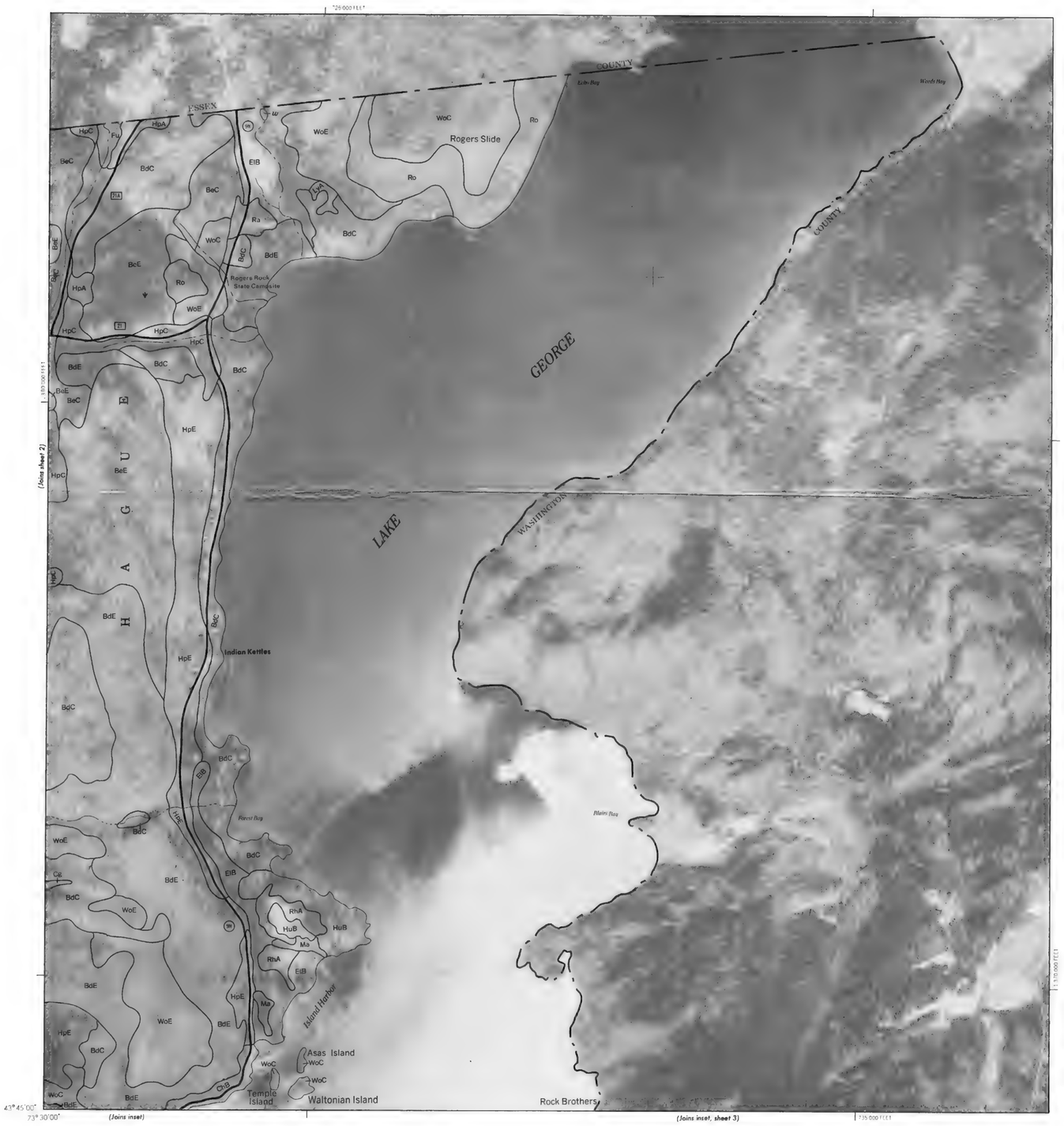
WARREN COUNTY, NEW YORK NO. 1

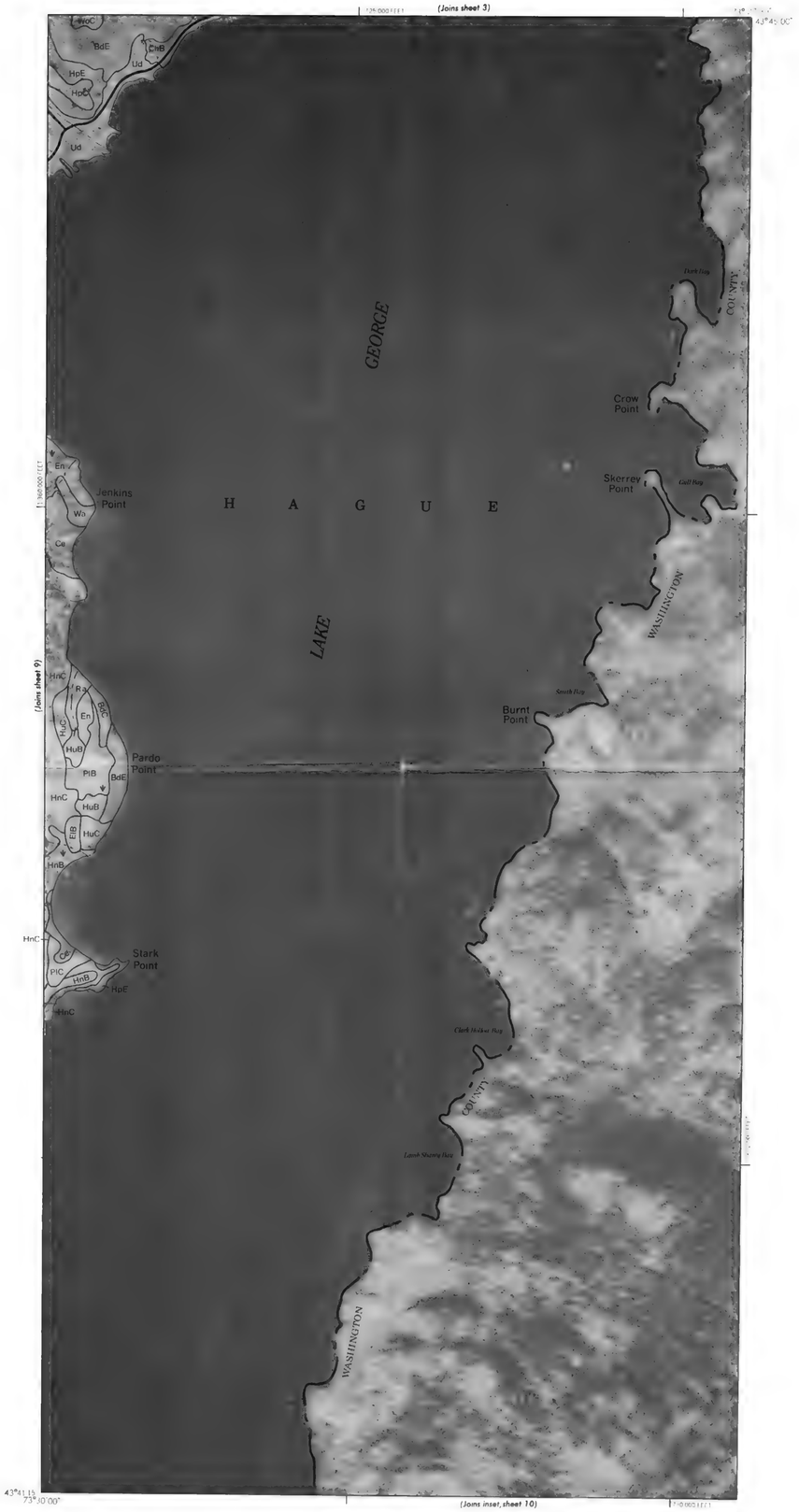
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N


ESSEX COUNTY
CHESTER
Pine Hill
Springhill Pond
Ellis Mountain
Trumbull Mountain
Thomas Mountain
Barton Mountain
Wintergreen Lake
Graphite
Round Mountain
Hudson River
Schroon River
Indian Brook
Stuyvesant Falls
(Joins sheet 1)
(Joins sheet 2)
(Joins sheet 3)
(Joins sheet 6)
(Joins sheet 9)





SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 3

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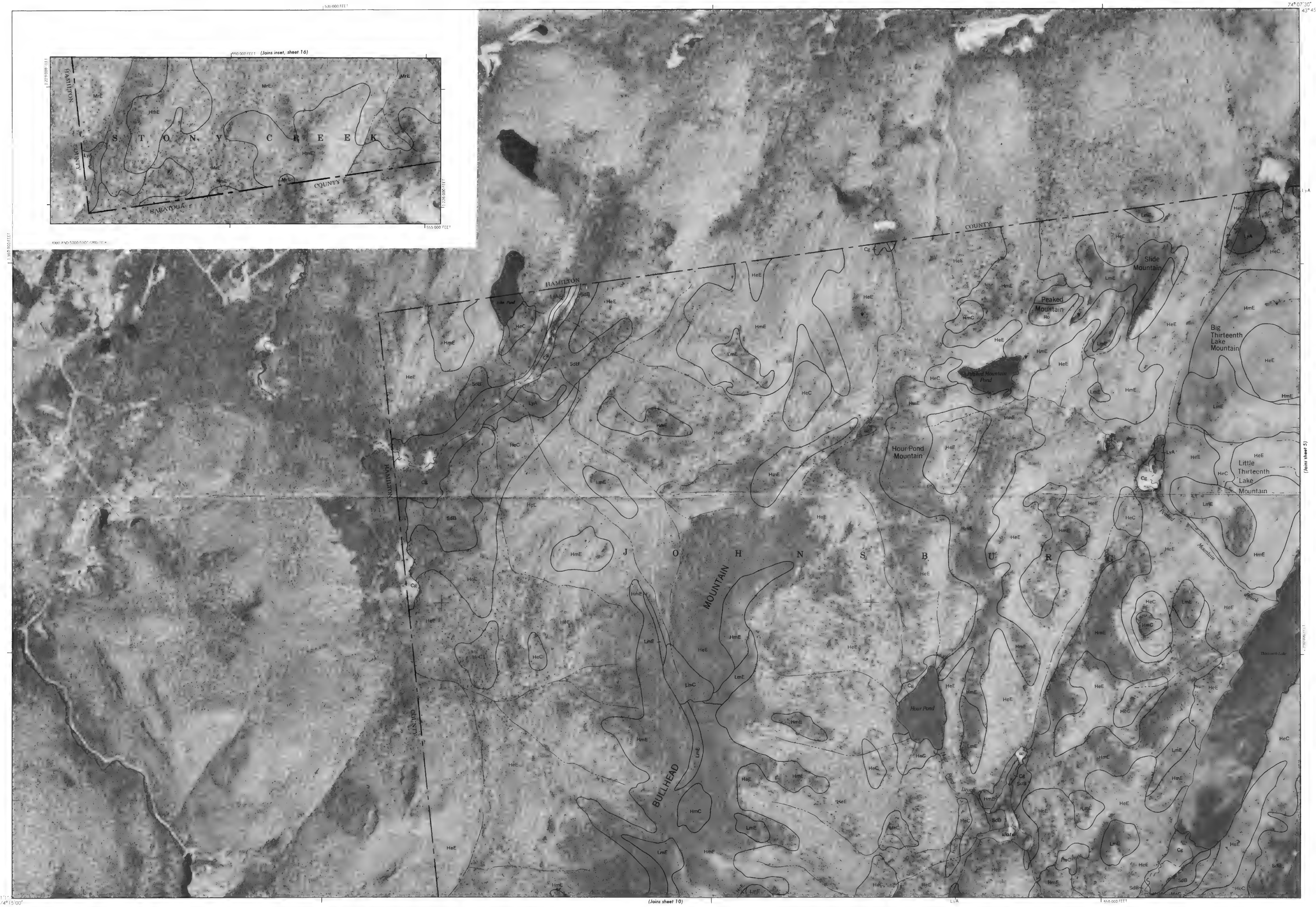

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 5

5

N

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 6

6

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

SCALE 1:15 840

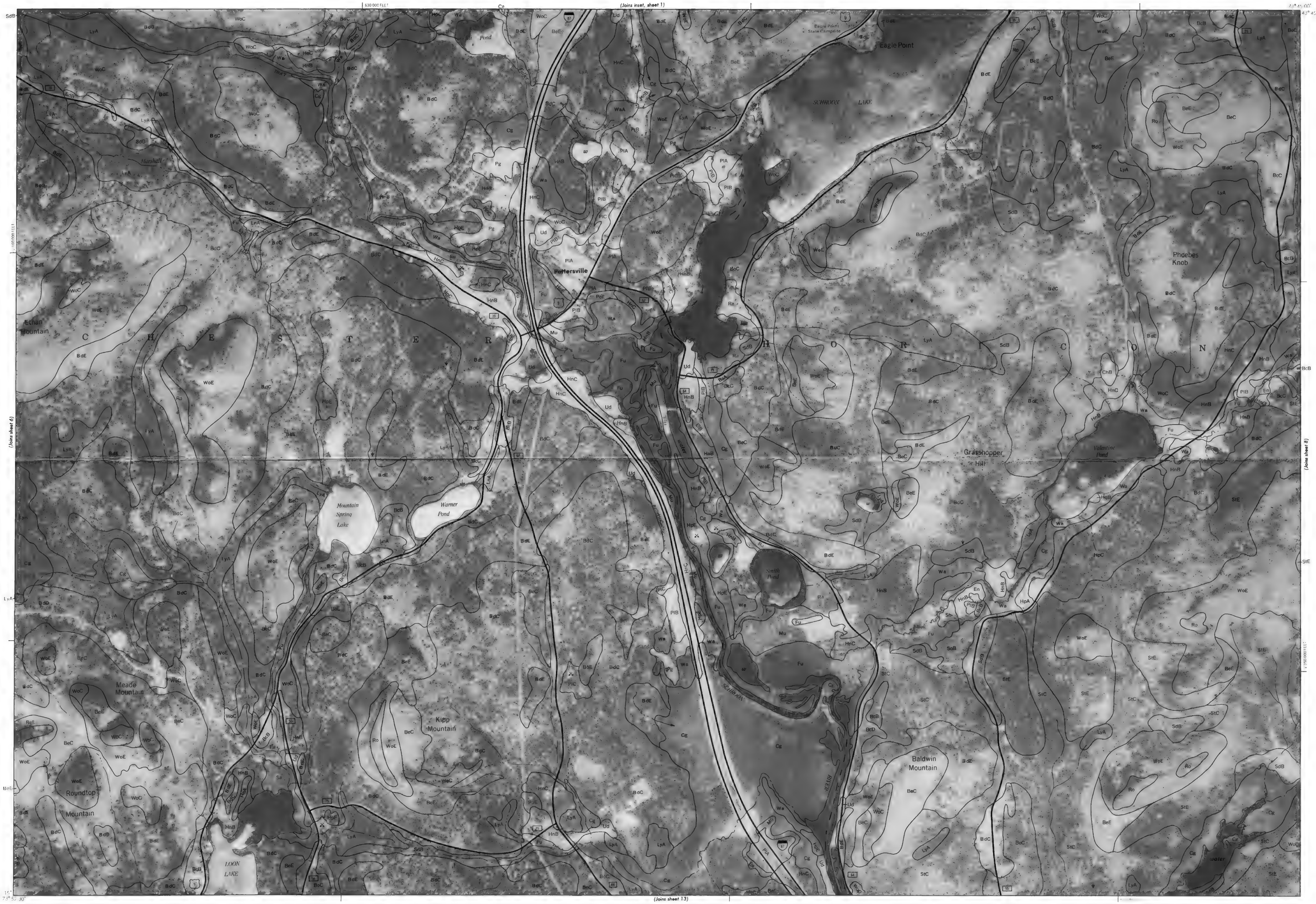
5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 6

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

7
N



SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 7

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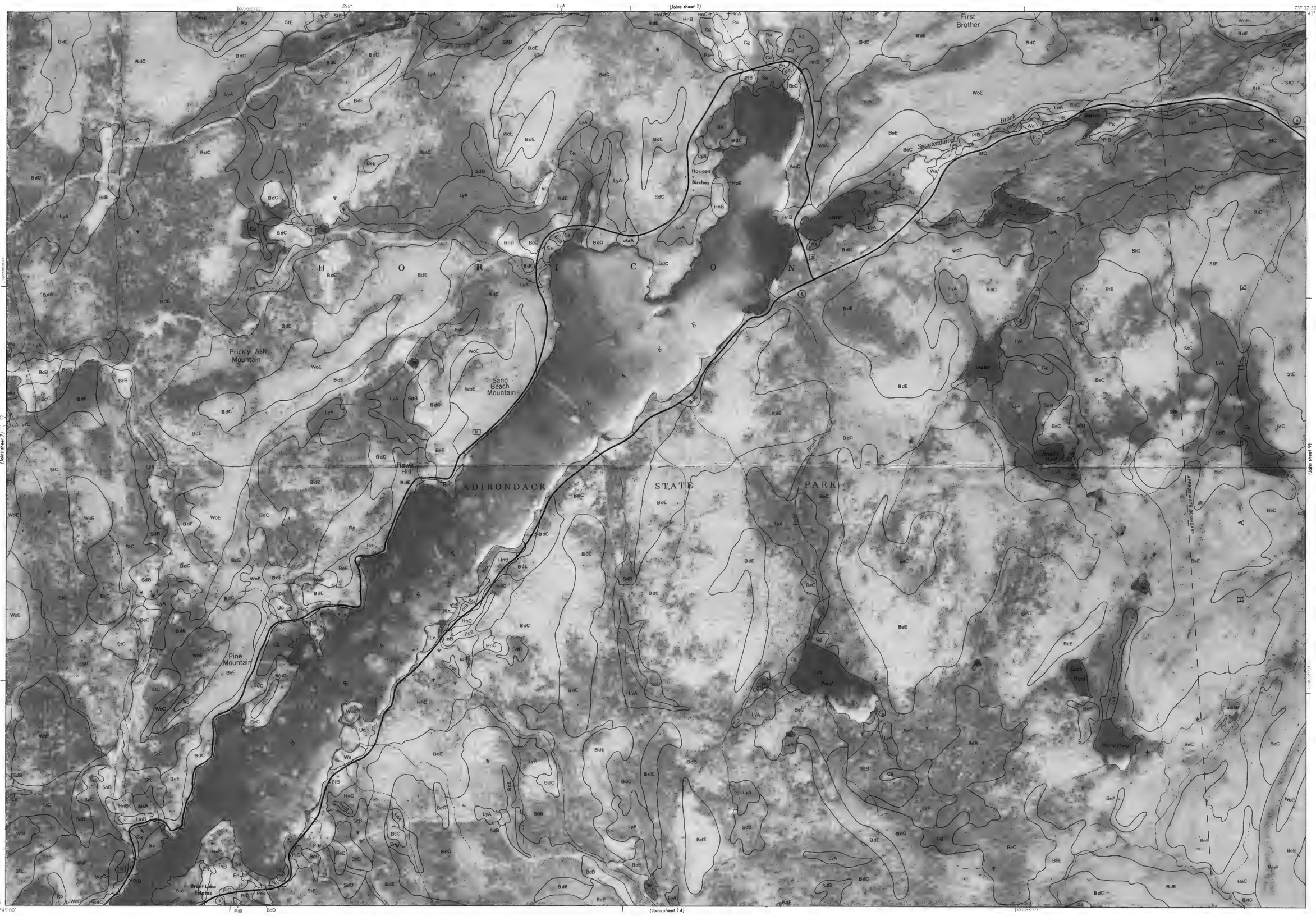
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 8

8

N



SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 8

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 9

9

N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

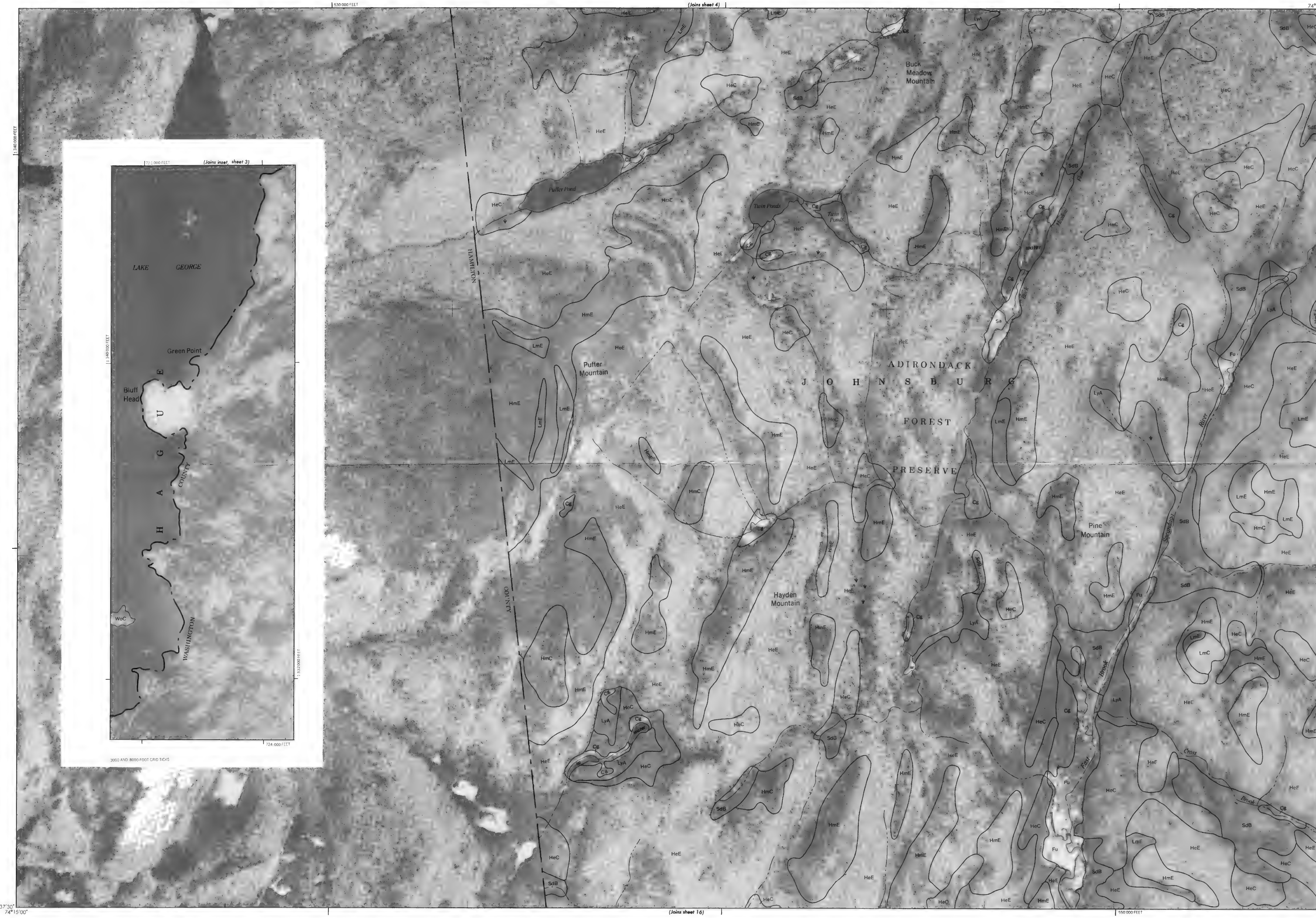
SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 9

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

11
N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 11

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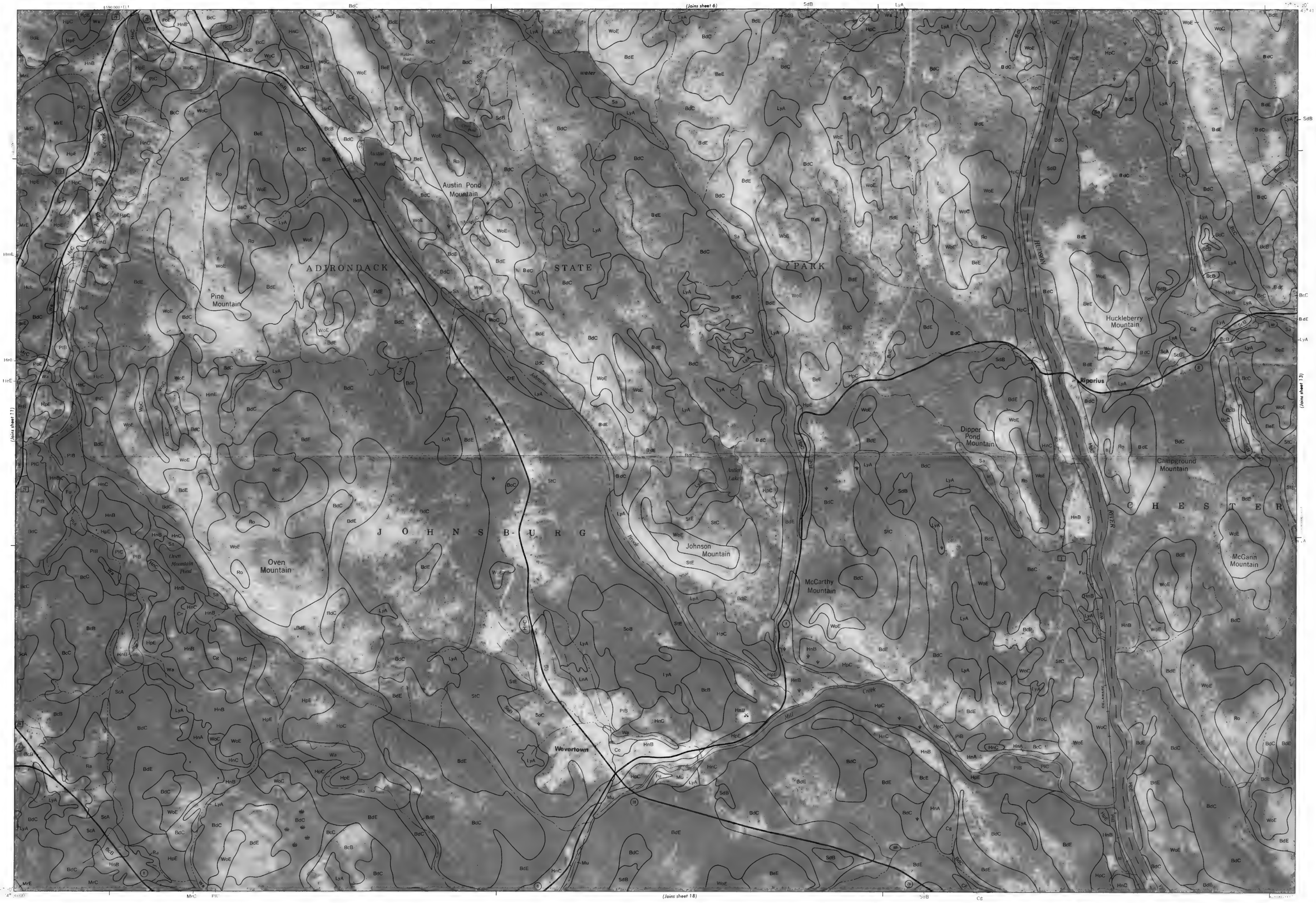

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO.

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

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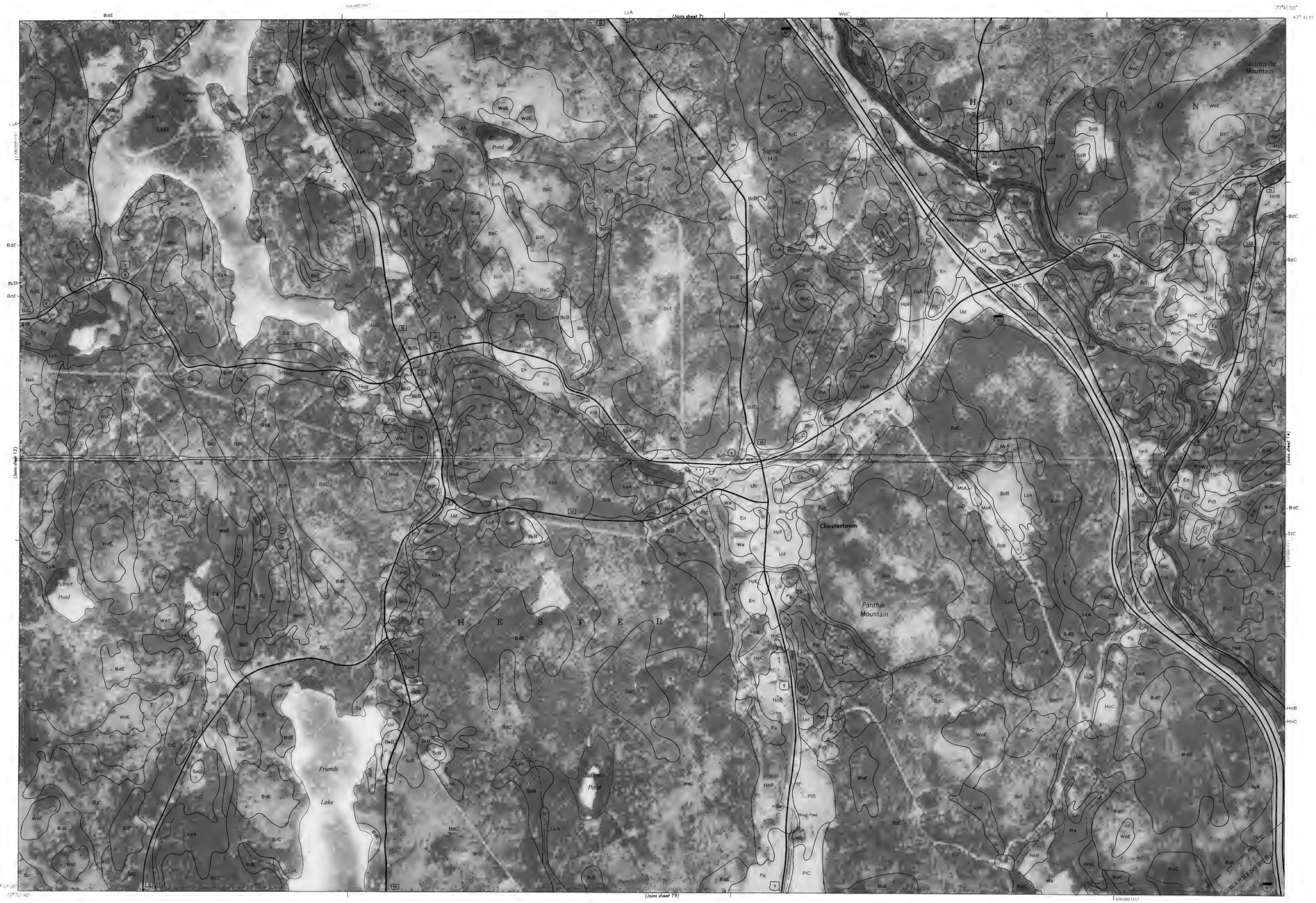

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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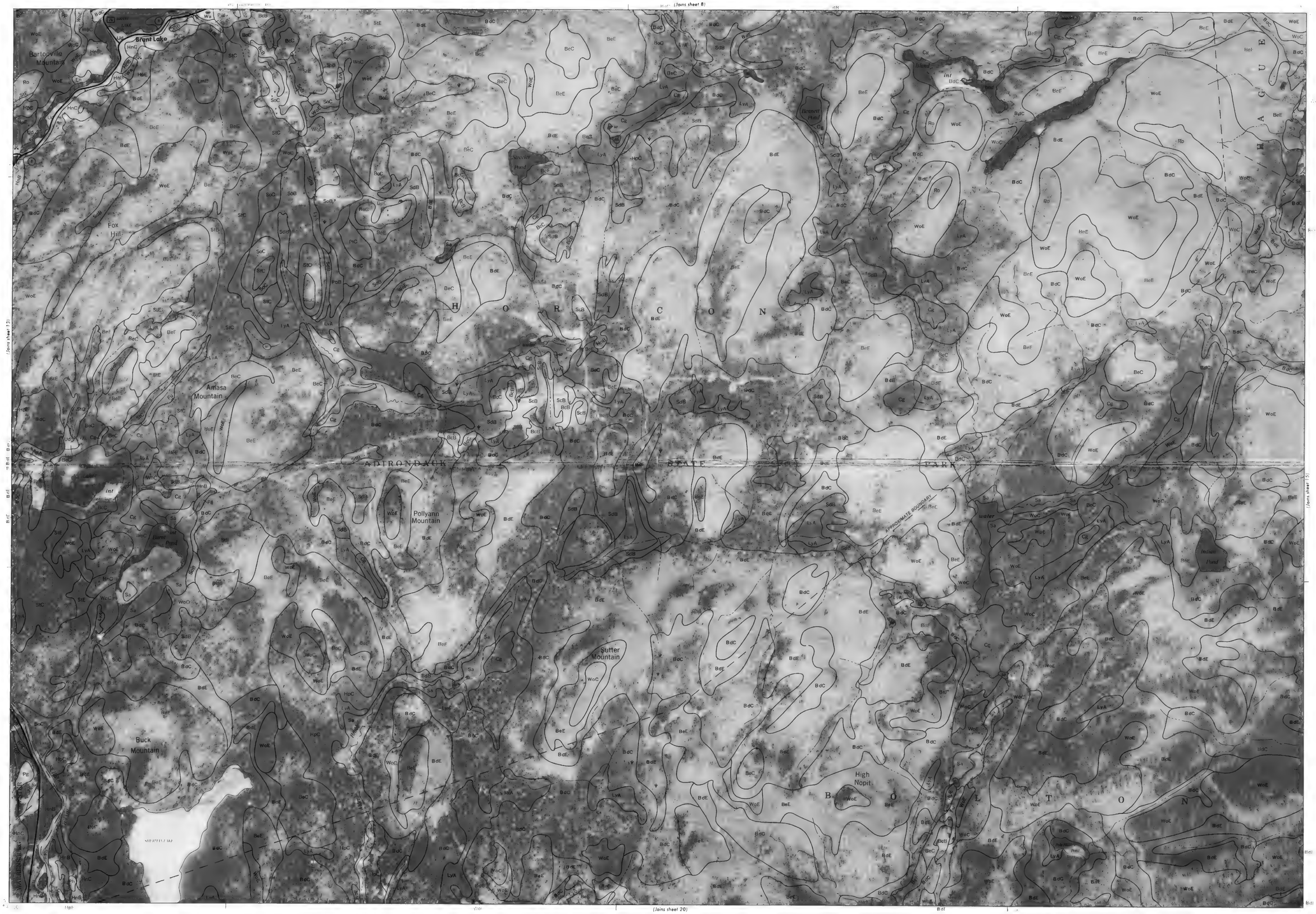

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

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MAPPED, COUNTY, NEW YORK NO. 14

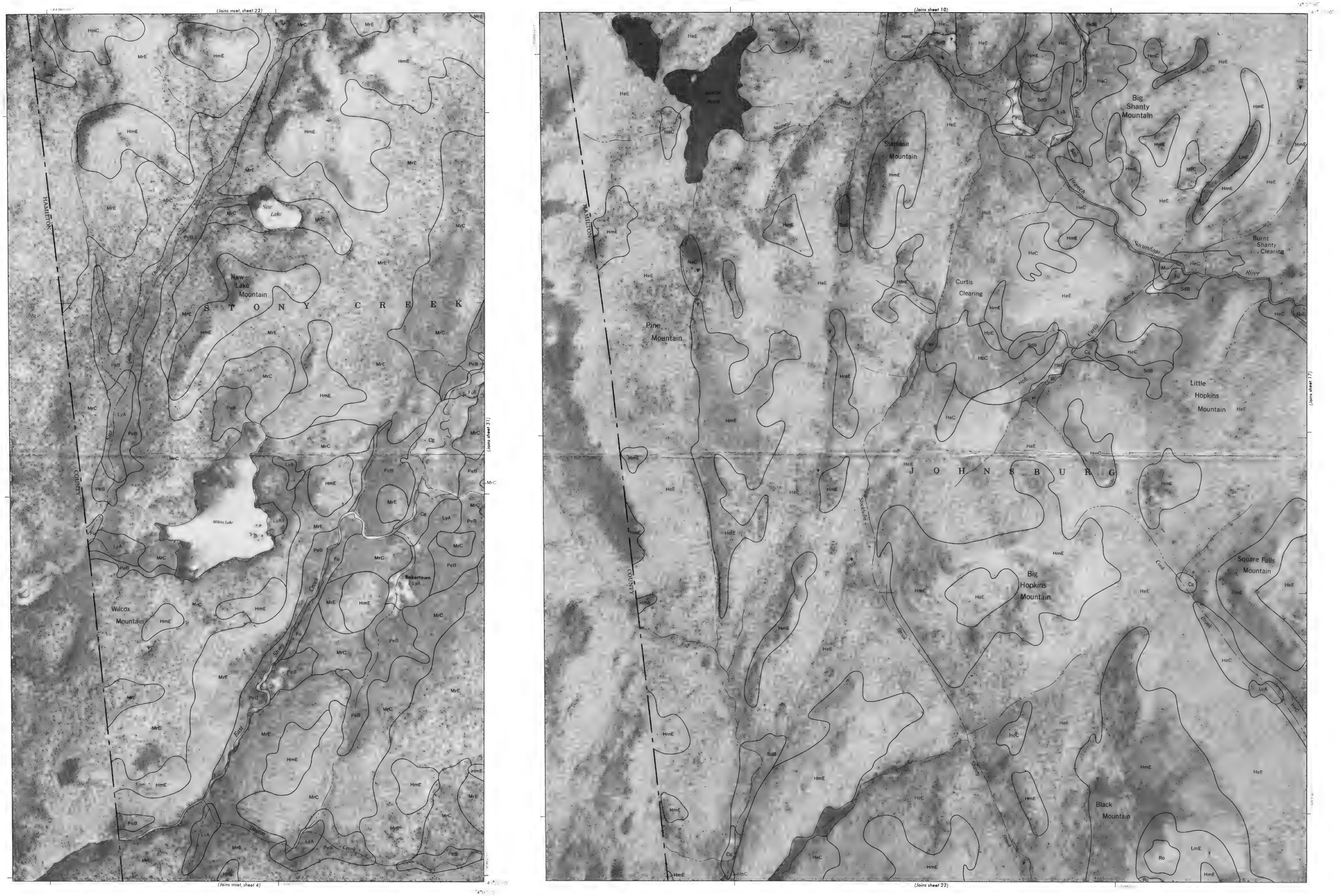
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



N

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 17

17

N

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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WARREN COUNTY, NEW YORK NO. 17

N

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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21
N

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 21

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9 000 AND 10 000 FOOT GRID TICK

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 23

23

N

SCALE 1:15 840

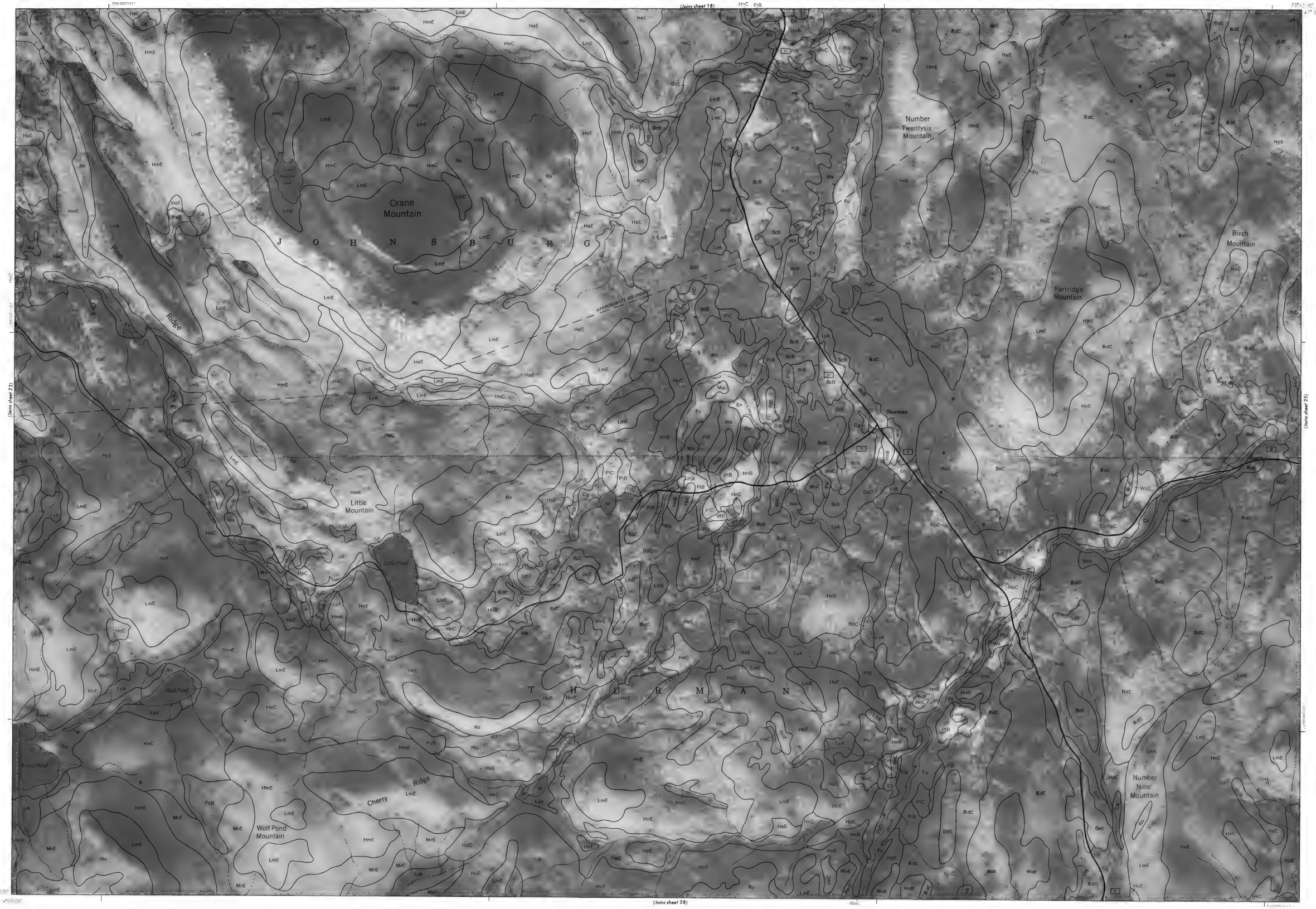
5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 23

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 24

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25
N

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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WARREN COUNTY, NEW YORK NO. 25

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 26

26
N

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

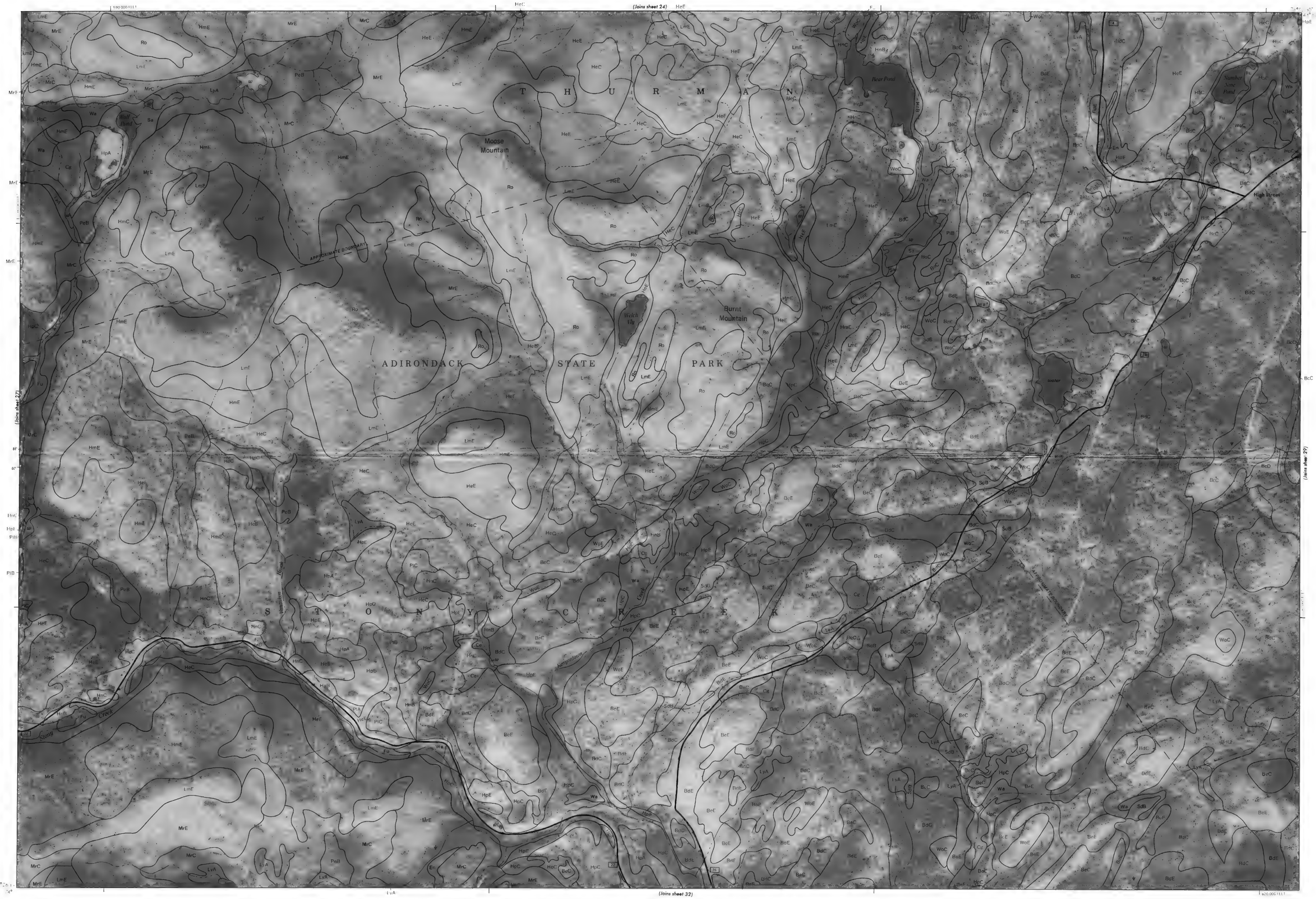
1000 Meters 800 600 400 200 0 1 Kilometer

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

28

N



SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 28

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 29

29
N

630,000 FEET

(Joins sheet 25)

73°45'00"
43°32'30"

WARRENSBURG

T H U R M A N

Sugarloaf Mountain

S T O N Y
C R E E K

W A R R E N S B U R G

SISTERS

THREE

Pine Mountain

Bald Mountain

Wegley Mountain

Phoebe Mountain

Shingle Mountain

L A K E
G E O R G E

APPROXIMATE BOUNDARY

(Joins sheet 28)

(Joins sheet 30)

(Joins sheet 33)

43°26'15"
73°52'30"

650,000 FEET

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 29

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

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30
N

SCALE 1:15 840
5000 Feet 4000 3000 2000 1000 0 1 Mile
1000 Meters 800 600 400 200 0 1 Kilometer

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 31

31

N

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 31

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 32

32

N

ADIRONDACK STATE PARK

Walnut Ridge

Stony Creek Station

Gill Mountain

West Mountain

Bear Mountain

Holmes Hill

Roundtop Mountain

Spruce Mountain

SARATOGA COUNTY

HUDSON RIVER

LAKE LUZERNE

(Joins sheet 28)

(Joins sheet 31)

(Joins sheet 33)

74°00'00"

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 32

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 33

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies.

Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 34

34
N

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SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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35

N

(Joins sheet 33)

(Joins sheet 36)

(Joins sheet 37)

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 36

36

N

660 000 FEET

(Joins sheet 34)

73° 37' 30"
43° 22' 30"

1 320 000 FEET

(Joins sheet 35)

(Joins inset A, sheet 39)

Lake Sunnyside

French Mountain

Glen Lake

Warren County Municipal Center

Westmont County Infirmary

Paradise Beach

Adirondack Community College

GLEN FALLS

PARK MOUNTAINS

ADIRONDACK

LUZERNE

QUEENSBURY

1 320 000 FEET

43° 18' 45"
73° 45' 00"

(Joins sheet 38)

680 000 FEET

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 36

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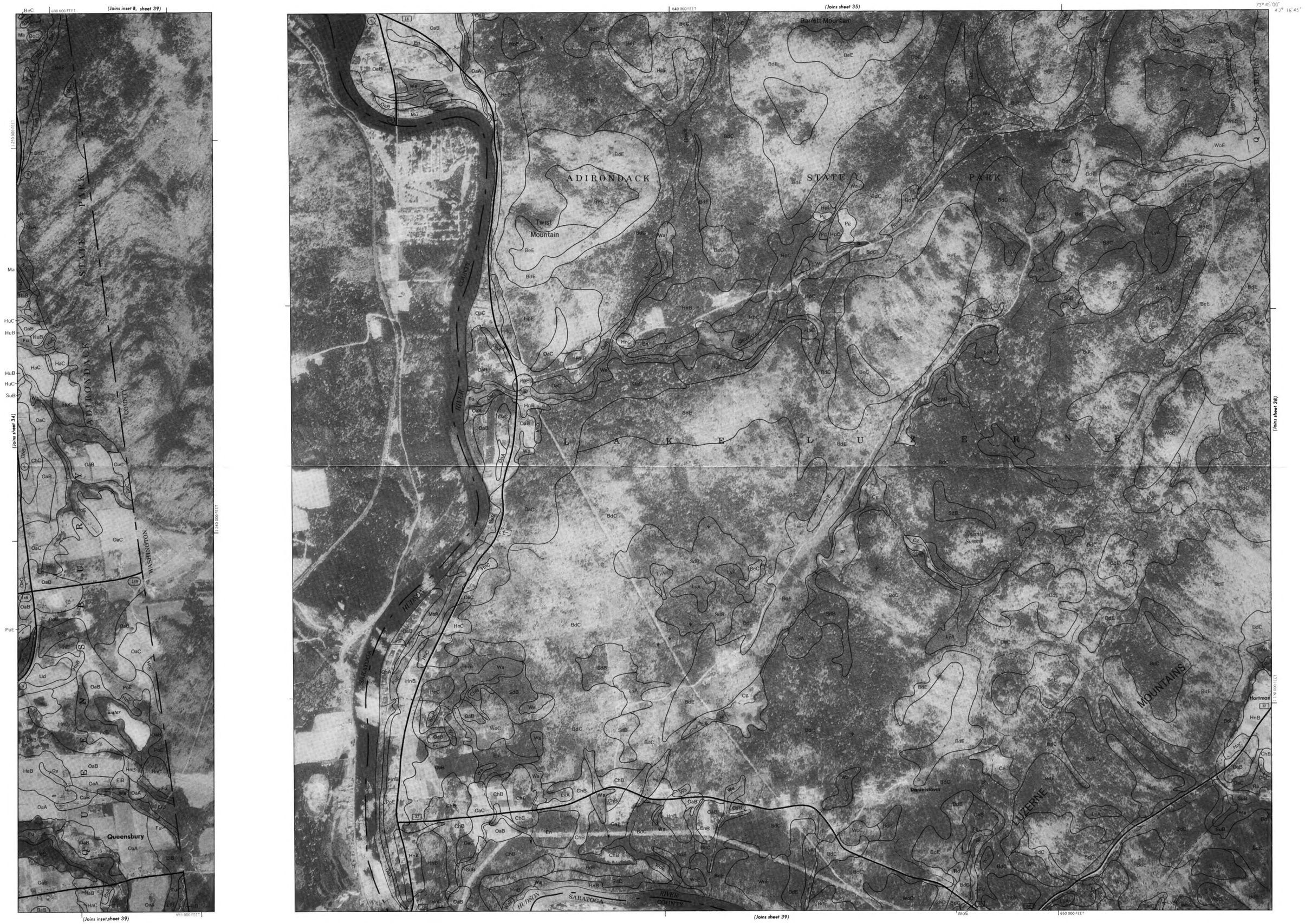
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 37

37
N



SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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WARREN COUNTY, NEW YORK NO. 37

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 38

38

N

660 000 FEET

(Joins sheet 36)

73°7'30"
43°15'45"

(Joins sheet)

1 200 000 FEET

(Joins sheet 37)

WEST GLEN FALLS

GLEN FALLS

QUEENSBURY

HUDSON RIVER

HUDSON

SARATOGA

COUNTY

WASHINGTON

Glen Lake

Hartman

APPROXIMATE BOUNDARY

1 190 000 FEET

680 000 FEET

43°15'00"
73°45'00"
(Joins inset, sheet 39)

(Joins inset A, sheet 39)

690 000 FEET

1 207 000 FEET

(Joins sheet 38)

695 000 FEET

1 205 000 FEET

2000 AND 5000-FOOT GRID TICKS

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

WARREN COUNTY, NEW YORK NO. 38

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY OF
WARREN COUNTY, NEW YORK
SHEET NUMBER 39

N

INSET A

INSET B

INSET C

WARREN COUNTY AIRPORT

GLEN FALLS

Q U E E N S B U R Y

L A K E L U Z E R N E

SARATOGA COUNTY

WASHINGTON COUNTY

HUDSON RIVER

(Joins inset, sheet 37)

(Joins inset, sheet 38)

(Joins inset, sheet 36)

(Joins inset, sheet 30)

(Joins inset, sheet 39)

(Joins lower right)

2000 AND 6000-FOOT GRID TICKS

2000 AND 4000-FOOT GRID TICKS

SCALE 1:15 840

5000 Feet 4000 3000 2000 1000 0 1 Mile

1000 Meters 800 600 400 200 0 1 Kilometer

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